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FEASIBILITY STUDY OF OBTAINING AN OPEN BURNING OPEN DETONATION
OPERATION PERMIT FOR DEMOLITION NAS KEY WEST FL
8/4/1988
ENVIRONMENTAL AND SAFETY DESIGNS INCORPORATED

**FEASIBILITY STUDY OF OBTAINING
AN OPEN BURNING / OPEN DETONATION
OPERATION PERMIT FOR**

**DEMOLITION KEY
NAVAL AIR STATION
KEY WEST, FLORIDA**

**PREPARED FOR
NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON, SOUTH CAROLINA**

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INTRODUCTION

In the late 1950's or early 1960's, Demolition Key was formed as a dredge spoil island for the purpose of detonating explosives. The island has been used continually for testing, training and disposal. Detonations associated with those functions have resulted in a navigable channel being formed through the center of the key.

In September 1983, an application for a hazardous waste temporary operation permit (TOP) was submitted to the Florida Department of Environmental Regulation (DER) for the disposal activities at Demolition Key which was approved. Disposal activities were suspended in 1986 after the TOP expired without renewal.

In December 1987, final regulations were promulgated under the Resource Conservation and Recovery Act (RCRA) for miscellaneous units. Open burning and open detonation (OB/OD) hazardous waste disposal facilities are regulated as miscellaneous units. Florida has since adopted these regulations and has authority to issue permits for miscellaneous units. Since interpretation of Subpart X assessment and monitoring requirements is highly subjective, DER may have substantially more rigorous application requirements than other states or the EPA.

The desire to obtain an operation permit for the activities at Demolition Key, along with the uncertainty surrounding the new regulations, is the reason for requesting this feasibility study. The key questions are in regard to which activities require permits, what other environmental regulations apply and the feasibility of obtaining an operations permit for disposal at Demolition Key.

The U.S. Environmental Protection Agency (EPA) has assembled a permit assistance team (PAT) specifically for handling permit applications for miscellaneous units. This team was contacted to get specific comments regarding the requirements for open burning/open detonation units. The PAT indicated that they could not provide such answers at this time. He suggested that applicants should submit whatever information is available by the due date and let the details be resolved later. Mr. Rabin Prusty of (DER) had similar comments.

The EPA is developing a permit writing guidance for miscellaneous units. However, the guidance will not be available until after the November 8, 1988 due date for the applications. The United States Army Environmental Hygiene Agency has developed a document titled "RCRA Part B Permit Writers' Guidance Manual for Department of Defense Open Burning / Open Detonation Units". This document explains the position taken by the DOD regarding the proper interpretation of 40 CFR 264 Subpart X regulations and has been submitted to the EPA.

However, this document was written in response to the proposed rules rather than the final rules. Further, the EPA has noted that it has some (as yet unspecified) reservations about the conclusions reached in the DOD guidance. This has resulted in a muddled situation where clear directives for using and interpreting the regulations do not exist. Even so, good judgements can be made regarding the feasibility of obtaining a RCRA operation permit through the Florida DER.

SUMMARY

A hazardous waste operation permit can be obtained for disposal of all anticipated explosive hazardous waste at Demolition Key using open burning and open detonation. To qualify for a permit, changes will have to be made in previous practices. The Florida Department of Environmental Regulation (DER) has stated that closure of the facility operated under the temporary operation permit will not be required, but corrective action for the previous disposal may be required under the permit. Also, an application for a temporary operation permit (TOP) should be submitted to the DER to allow disposal until an operation (and possibly a construction) permit application can be reviewed which may take years.

The previous practices of open burning without containment and underwater detonation are not necessary and should be discontinued. These methods of disposal pose a greater threat to soil/ground-water contamination and surface water contamination, respectively, than open burning with containment and open detonation on soil. Because of their greater threat to the environment, open burning without containment and underwater detonation would require more extensive environmental assessments and monitoring. The greater threat might even negate obtaining a permit.

The DER will probably require a detailed environmental impact assessment of all open burning with containment and open detonation on soil to prove that the environmental performance standards of §264.601 are being met rather than a preliminary assessment only. A preliminary assessment would make use of only existing data while a detailed assessment would include, at a minimum, computer modeling of air impact, soil sampling and analysis, and a hydrogeological assessment including an initial one-year groundwater monitoring program similar to the one set under §264.90 - §264.98. Since the DER has not yet specifically required a detailed assessment at this time, a preliminary assessment should be submitted with the initial application and allow the DER to make a more definitive request in response to the initial submission.

The Florida DER and the EPA have reserved comment on the necessity of ongoing monitoring requirements during the active life, closure and post-closure phases of operation. An ongoing ground-water and soil monitoring program is likely for all OB/OD units except extremely arid, isolated regions. The Army study of twenty-six OB/OD sites may substantiate that such monitoring is not needed. However, this is a judgement to be made unilaterally by DER and cannot be definitively answered at this time.

A post-closure plan should not be submitted with the initial application since there has been no definitive ruling requiring one for OB/OD unit. However, a good case can be made that open detonation is ground treatment. If so classified, the facility would require a post-closure plan including ground-water monitoring. So, any cost estimates for operating the facility should consider this contingency. Also, it is advisable to provide secondary containment for open burning units with containment to minimize any potential for future soil, surface water and ground-water contamination.

The DOD and the EPA have reached an agreement that explosive ordnance to be treated will not become explosive hazardous waste until it is received at the disposal area. This eliminates the requirement to follow RCRA storage and transportation regulations until that point. However, the DER has stated that they do not accept this interpretation and consider it to be waste at the point when the decision is made to dispose the material. If the DER adheres to this decision, then the hazardous waste will have to be stored and transported according to the appropriate regulations. Further, a transporter license and a transporter permit will be required to transport the material between Fleming Key and Demolition Key.

The operating procedures in NAVSEA OP5, Chapter 11 need to be modified or supplemented to conform more with the requirements of RCRA and the best management practices listed in the DOD guidance manual. Specifically, proper methods of ash handling, inspections and recordkeeping need to be addressed. Even though Demolition Key has a radius smaller than the minimum distance to the property of other described in 40 CFR 265 Subpart P, and even though there is no security fence around the key, DER has accepted the current security strategy and has not asked for any modification to it. However, the key is adjacent to an intracoastal waterway and will always be subject to future, more stringent evaluations.

When the key is cleared of all vegetation, except the mangroves at the perimeter, it becomes an ideal nesting site for Least Terns which are protected by the State of Florida. If nesting occurs, either disposal will have to be suspended during the nesting period, April through August, or a means to prevent nesting will need to be developed. Although Demolition Key is in close proximity to two National Wildlife Refuges and is in a Florida Outstanding Water area, no other environmentally sensitive species should be adversely affected by the operation of the OB/OD facility.

All testing and training activities are excluded from RCRA regulations for disposal. If these activities generate hazardous waste, they will be subject to all appropriate regulations for hazardous waste generators or other regulations, such as the Clean Water Act or the Safe Drinking Water Act. Depending upon the nature and extent of contamination generated by underwater testing, surface water contamination may become an issue for that activity.

The only good alternative disposal method to the proposed disposal methods is neutralization of black powder by immersion in water as described in NAVSEA OP 5. However, this would require an additional permit and would not eliminate the need for OB/OD permitting. Other options, such as incineration, are less desirable than OB/OD. Some reasonable alternatives are shipping the waste material to another permitted Naval facility or to relocate the facility to a larger key further away from traffic and environmentally sensitive species.

DISCUSSION

The following discussion is divided into eight sections which will address the eight items listed in the contract scope of work. The topics are discussed in the same order as they appear in the scope of work.

I. IDENTIFY ALL COMMANDS USING DEMOLITION KEY AND THEIR MISSION.

Explosives Ordnance Disposal (EOD) has either received or may in the future receive explosives from numerous sources. The Naval Air Development Center (NADC) tests explosives for research and development purposes. Other groups such as, NAS Key West, the Coast Guard, the Federal Bureau of Investigation, the Drug Enforcement Agency, and state and local law enforcement agencies, send the EOD suspicious packages or known explosives they have obtained. All these explosives are stored at Fleming Key.

All detonations or burnings at Demolition Key are conducted exclusively by EOD. Personnel from other commands may observe the procedures for testing or training purposes but are in no way acting in a supervisory capacity. Representatives from NADC may supply information regarding proper handling procedures, but the EOD has ultimate authority over all personnel and activities on Demolition Key.

II. IDENTIFY ALL EXPLOSIVES, FLAMMABLES AND OTHER MATERIALS USED OR DISPOSED ON SITE, THE FREQUENCY OF THEIR USE OR DISPOSAL AND THE RESPONSIBLE COMMAND.

A. SOURCES TO EOD

Approximately 2,000 pounds of explosives per year are received by EOD. Half of this material is supplied by NADC. Thirty per cent is received from NAS Operations. Ten per cent each is received from law enforcement agencies and materials for training purposes. During discussions with EOD, an agreement was reached to apply for 5,000 pounds of permitted disposal capacity to account for variances in disposal rates.

B. TYPES OF EXPLOSIVES RECEIVED

Approximately half of the materials received are black powder, TNT, ammonium nitrate amatol, and Comp C-4. Equal amounts of nitroglycerine, tetryl, smokeless powder, RDX (cyclonite), TETN, dynamite (military and commercial) and the composites, A-3, B, C-3 and H-6. Very small amounts of fuse materials, lead azide, picric acid and styphnate, are received. It is possible that in the future explosives such as red and white phosphorus, thermite, PBX, HMX and HBX may be received and disposed. Also, kerosene, fuel oil and gasoline are used to facilitate open burning.

C. FREQUENCY OF DISPOSAL

Of all the materials received, only that material received from NAS Operations and from law enforcement agencies is disposed as explosive hazardous waste. The materials used in testing and training are not defined as hazardous waste and is not a RCRA regulated activity. Approximately, 2,000 pounds of explosive hazardous waste per year will be disposed. Disposal operations will occur at a rate of four-to-five times per month. Actual monthly rates will vary due to inventory and weather conditions.

III. A WRITTEN SUMMARY OF THE PROCEDURES USED IN DETONATING OR DISPOSING OF EACH PYROTECHNIC, EXPLOSIVE OR OTHER MATERIALS SHOULD BE PROVIDED.

Currently all disposal activities have been suspended by the Navy. The following are summaries of the disposal procedures as stated in NAVSEA OP 5 VOLUME 1, "AMMUNITIONS AND EXPLOSIVES ASHORE: SAFETY REGULATIONS FOR HANDLING, STORING, PRODUCTION, RENOVATION AND SHIPPING", CHAPTER 11, "DISPOSAL" and NASKW INSTRUCTION 8027.5C, 14 April 1987. It should be noted that a set of "Best Management Practices" are included in the United States Army Environmental Hygiene Agency manual, RCRA Part B Permit Writers' Guidance Manual for Department of Defence Open Burning/Open Detonation Units. The Environmental Protection Agency is using this document as the primary source of input from the Department of Defense in developing the EPA guidance for OB/OD Part B permit writers' guidance.

Since no disposal activities are currently taking place at Demolition Key, the procedures will be summarized as they are presented in these two documents. Any discrepancies will be noted. Also, note that open burning has always occurred without either primary or secondary containment.

A. GENERAL

1. AUTHORIZATION AND NOTIFICATION

No materials will be destroyed without specific authorization and instructions from NAVSEASYS COM (SEA 06G) in each specific instance. All routine disposal operations will be conducted in accordance with the requirements of and approved by the cognizant EOD group commanders. Use of the site will be restricted to the hours, 0800-1600, on weekdays except for emergency disposal.

Permission to use the site is obtained from the NAS Key West Weapons Officer at least twenty-four hours prior to the scheduling of demolition operations. The Demolition Range Use Notification Form (Appendix A) is used to assure that all appropriate military and local authorities have been informed of the impending activities. All disposal operations are planned and conducted with consideration of the effects of fumes, smoke and noise on the public domain.

Prescribed specific procedures in connection with the disposition of each specific type or condition of explosives are posted at the site. Likewise, appropriate station orders or regulations for the operation are established.

2. PRELIMINARY ASSESSMENT

Prior to commencing operations at the site, the EOD Officer in Charge ensures that:

Favorable weather conditions, such as wind direction and cloud cover, exist. Detonation is not performed during periods of heavy, low total overcast.

Ample visual and audible warning , such as display of BRAVO FLAG and sounding of whistle or siren, is given.

Operable communications are available and can provide for rapid contact with NASKW ATC Officer, EODMU FOUR and the NAS OOD.

A safety boat is available to stop, warn and request that boats in the immediate area remain clear during operations.

The procedures used in the disposal of each type of munition are in accordance with standard operating procedures or other current directives and that all safety precautions peculiar to the operation are observed.

All munition and hazardous materials which are in the vicinity awaiting use or destruction are protected from flying missiles, fragments, sparks, etc.

Only when the shot firer has ascertained that the field is clear, including the surrounding waters, that no aircraft are over the range, and all personnel at the site are safely sheltered in the bunker, will the shot be fired.

3. PAD REQUIREMENTS

The ground within the immediate vicinity of the pad area will not exceed a 10° grade. Concrete, gravel or cinder surface plots are not used because of their propensity to capture munitions resulting in an explosive environment.

The pad area is to be a minimum of 1800 feet from any magazine, storehouse, inhabited building or other structure and any public highway or passenger railroad. These requirements are met, but a channel used as a public waterway is within the 1800 feet radius. During burning operations, traffic will be prohibited from passing through the radius.

The operations manual requires that the pad area shall be free from tall grass, undergrowth and shrubbery. The dimensions of the key prohibit meeting this requirement

since it requires removal of mangroves. However, all non-protected vegetation will be removed. Further, all vegetation such as dry grass, leaves, as well as other combustible materials and glass or glass particles are removed within a radius of 200 feet of the pad for burning and 500 feet for open detonation.

4. PERSONNEL

Commanding officers are responsible for the assignment of personnel to operations at disposal areas. All disposal personnel are well qualified, fully informed regarding the hazards to be encountered and the applicable operating safety precautions to be observed, and capable of safely performing their duties. All disposal personnel are given overall instruction as frequently as considered necessary by the commanding officer to assure safe operational policies and procedures. The number of personnel at the site is kept to a minimum, but no one is allowed to work alone.

5. SAFETY EQUIPMENT

Sufficient and suitable protection for personnel is provided in the form of clothing and shelter. A minimum of two fire blankets are provided. The shelter is protected by a barricade and is at least 100 feet from the pad. The current barricade is currently scheduled for improvements and repairs. Such actions will require the application for a hazardous waste facility construction permit.

A minimum of two fire blankets are provided for emergency use. Personnel are instructed in the proper use of the fire blankets. Properly manned and equipped mobile fire-fighting equipment is standing by in a safe location or can be readily available within five minutes.

Two-way radio communication with the station network, including emergency and fire-fighting units is available during disposal. Radio transmitting equipment is secured during extension of electric firing system except in the case of an emergency.

6. WEATHER

Disposal of explosives is not conducted during electrical storms. Wind and cloud cover conditions may have adverse effects on open burning and open detonation disposals. Specific requirements are stated for each method of disposal.

7. MATERIALS HANDLING

Explosive hazardous wastes are not handled, stored or disposed unless the materials are specifically identifiable and the characteristics are known (except in emergency situations). The volumes to be disposed at one time are consistent with safe operations.

All explosive hazardous wastes are transported in motorized vehicles which are approved for this service. The containers are secured against falling or movement during transit.

8. ACCIDENTS

All accidents are reported immediately to COMNAVSEA-SYSCOM. The commanding officer of the concerned activity will immediately appoint a board of qualified, but not involved personnel to investigate and assemble details concerning the accident. When the accident happens, work is suspended as is consistent with safety.

9. CLEANUP

Following detonation or burning, the area is inspected for the presence of unburned or unexploded ordnance. All such items discovered shall either be disposed immediately or returned to a proper magazine to await future disposal. The Army guidance requires that all ash and other debris be removed to minimize the potential for ground-water contamination. This practice has not been followed in the past. If practical, the ground point of a burn is wet down with water.

The NASKEYWEST OPS Duty Officer and the NAS OOD is informed that demolition range operations are secured. The NAS OOD and the NAS Weapons Officer are appraised of any suspected residual hazard remaining from demolition or burning operations at the range.

B. OPEN BURNING WITHOUT CONTAINMENT

Materials to be burned are always removed from containers to eliminate confinements which can cause explosions. The materials are also inspected for detonation or blasting caps. The empty containers are removed a minimum of one hundred feet from burn. Wet scrap propellant is burned in different locations from dry scraps.

Prior to delivery of materials to a pad, the pad is inspected for dangerous materials or prohibited foreign material. Please note that the term pad only means the area where the waste will be burned and does not imply an engineered structure beyond a cleared, relatively level area. If the pad has been used previously the same day, it is inspected to verify that it is not dangerously warm and is free from flowing, smoldering or burning embers or residue.

Ignitable fluids, such as kerosene, gasoline and fuel oil, are used to douse the wastes prior to ignition to facilitate combustion. Ignition of explosives to be burned is accomplished by placing the squib or safety fuse in a small pile of web (powder grains) smokeless powder located so as to overlap the edge of the explosives to be burned. The connecting trains laid between burning pads is dry smokeless powder, four to six inches wide and having a minimum center depth of one-and-a-half inches.

At least five minutes after the burning has visually exhausted itself, the supervisor and one operator inspect the site for completeness of burn, heat retainment and any other dangerous conditions. The area is then wet down thoroughly with water. This procedure induces run-off of hazardous waste and is another reason for open burning with containment.

The DOD guidance manual includes cleanup and removal of all ash and other residue as potential hazardous waste as part of their best management practices. This greatly reduces the potential for soil, ground-water and surface water contamination. This procedure should be included in the formal operating procedures.

C. OPEN BURNING WITH CONTAINMENT

At this time, no open burning with containment has taken place. Since this is the preferred method for open burning by the regulatory agencies and by the United States Army Environmental Hygiene Agency, this method will likely be used in the future. Further, secondary containment is highly desirable to minimize releases to the environment.

Appendix B contains a burning tray design proposed by the Navy. Operating procedures for this method are essentially the same as for open burning without secondary containment except as they relate to the use of the tray. The tray must be inspected for the presence of dangerous materials before and after use and must be inspected regularly to verify its integrity.

D. OPEN DETONATION ON SOIL

Only the following types of ammunition and explosives are disposed by open detonation at Demolition Key:

- (1) Detonators
- (2) Bulk dynamite
- (3) Explosive-loaded grenades
- (4) High explosive bombs
- (5) Mortar ammunition
- (6) Projectiles
- (7) Rocket/missile warheads

All vegetation is to be cleared within a 500 feet radius. This is scheduled for the key at the time of the permit application. It will be impossible to clear all the vegetation since the mangroves are to be undisturbed. This exemption from the procedures does not appreciably affect safety and should be written into the operating procedures.

The required minimum distance from any magazine, storehouse, inhabited building or other structure, and public traffic route is 1800 feet. Since navigable channels pass next to and through the key, this procedure is violated. However, the Navy uses boats to prohibit entrance into this radius to protect the public.

The specific requirements for placement of items at the detonation site, the placement of ignition charge, the method of priming and other requirements pertaining to the particular ammunition to be detonated are as required by EOD procedures or Routine Ordnance Detonation Advisory Procedures (RODAP) prepared by those Naval activities on the distribution for NAVSEAINST 5220.2 series based on specific requirements of NAVSEA OP5.

After at least five minutes after the detonation, the grounds are searched for unexploded ammunition and explosives. Items such as lumps of explosives or unfuzed ammunition are picked up and prepared for the next detonation. Fuzed ammunition or items which may have internally damaged components are detonated in place.

The best management practices in the USAEHA guidance call for collection of all generated ash and debris to be collected and disposed as hazardous waste. This will minimize the contamination of soil, ground-water and surface water. This should be adopted as part of the formal operating procedures.

E. UNDERWATER DETONATION

Detonation of hazardous waste under water has been conducted in the past to minimize noise and air pollution. Since this method can pollute surface water directly, it may not be used in the future because of the difficulty in obtaining a permit because of its . There are no specific procedures are given in NAVSEA OP5, nor is the subject addressed in the DOD guidance manual.

In general, underwater detonation is handled similarly to open detonation on soil. Typically, the waste is detonated at minimum depths of ten feet. Policing the area after detonation will be limited to collecting debris.

IV. IDENTIFY, EVALUATE AND SUMMARIZE ALL FEDERAL, STATE, LOCAL, AND NAVY REGULATIONS AND REQUIREMENTS FOR OPERATING AN OPEN BURNING/OPEN DETONATION HAZARDOUS WASTE UNIT ON DEMOLITION KEY.

A. FEDERAL REGULATIONS AND REQUIREMENTS

On December 10, 1987, a new set of regulations were published in the Federal Register (Appendix C) for miscellaneous units. The bulk of the changes in the RCRA regulations were in the new Subpart X of 40 CFR 264, "Miscellaneous Units".

Unlike previous regulations for hazardous waste facilities which spelled out numerous, specific requirements, the heart of these regulations were in the form of environmental performance standards in Section 264.601. These were to be supplemented by any other regulations for hazardous waste units which were the same or similar to the miscellaneous units. Therefore, a miscellaneous unit using a tank or tank-like structure would also be subject to the regulations applicable to tanks. Also, all general subparts (A-H), such as "Preparedness and Prevention", would apply.

Many comments were made regarding open burning / open detonation units for the regulations during the proposed phase of adoption. In response, the EPA has formed a Permit Assistance Team (PAT) and is developing a guidance for open burning / open detonation. The PAT was contacted but has no definitive guidance, as yet. The guidance is being developed using the DOD guidance manual as one of their sources. The PAT commented that the monitoring and analysis proposed by the DOD guidance manual may be inadequate.

The PAT did not provide any clarity to extent of assessment and monitoring needed to fulfill the requirements of Sections 264.601 and 264.602. Their position is that such decisions will be made subsequent to submission of the assessment with the permit application. Interpretation of the requirements of these sections is highly subjective. Since the DER will write the permit, they may interpret the requirements of the regulations in a much more stringent manner than the EPA.

A detailed discussion of the requirements of Sections 264.601 and 264.602 is given in Appendix D. The regulations require that a preliminary assessment of these three media be made to determine the effects of operating the facility. If the preliminary assessment demonstrates that the environmental standards of 264.601, and if the Director of the regional EPA agrees, a detailed assessment will not be needed. For those standards which do not meet this criteria, a detailed assessment will be performed. If this assessment demonstrates that the standards are not violated, and if the Director agrees, then monitoring of these media will not be needed. Monitoring may be required to ensure that the standards are not being violated. The defined means of assessment and monitoring are those suggested by US Army Environmental Hygiene Agency in their guidance. The EPA may be more stringent in their requirements.

A detailed environmental assessment will probably be required prior to obtaining a hazardous waste operation permit. A detailed environmental assessment would include, at a minimum, computer modeling of air impact, soil sampling and analysis, and a hydrogeological assessment including an initial one-year ground-water monitoring program similar to the one set under §264.90 - §264.98. Since a detailed assessment has not yet been specifically required, a preliminary assessment should be submitted with the initial permit application and allow the requirements for a detailed assessment be defined through notices of deficiency.

It is not likely that ongoing air monitoring will be required because of the small annual quantities of pollutants emitted to the atmosphere. However, ongoing ground-water and soil monitoring probably will be required to satisfy §264.602. The ground-water monitoring, if required, would probably be consistent with the regulations for 40 CFR 264 Subpart F. Also, if open burning or open detonation is declared to be "land treatment", then a post closure plan would be required. Since none of these monitoring requirements have as yet been specifically required and are very much open to debate, they should not be included in the initial permit application. These questions should be resolved through notices of deficiency.

The Florida DER stated their opinion that the explosives that are to be disposed are hazardous wastes at the moment it is decided to dispose them. This is in conflict with the agreement between the DOD and the DOD that these materials are not hazardous wastes until they are delivered to the disposal site (Attachment E). This would mean that the EOD site at Fleming Key is storing hazardous waste and would be subject to the hazardous waste storage and transportation provisions of RCRA as well as obtaining a transporter license and permit. Further, the FDER insists that a hazardous waste manifest is required for shipments between Fleming Key and Demolition Key.

The operating procedures in NAVSEA OP5, Chapter 11 need to be modified or supplemented to conform more with the requirements of RCRA and the best management practices listed in the DOD guidance manual. Specifically, use of containment for open burning, proper methods of ash handling, inspections and recordkeeping need to be addressed. Even though Demolition Key has a radius smaller than the minimum distance to the property of other described in 40 CFR 265 Subpart P, and even though there is no security fence around the key, DER has accepted the current security strategy and has not asked for any modification to it. However, the key is adjacent to an intracoastal waterway and will always be subject to future, more stringent evaluations.

The EPA and the FDER have stated that underwater detonation for testing purposes only does not require a RCRA or any other permit, but documentation to support that is required. Underwater detonation for disposal of a hazardous waste would need a permit. The conditions for meeting the requirements for Section 264.601 are very unclear and could be quite extensive and expensive. Since underwater detonation disposal is not necessary, it should be discontinued.

B. STATE REGULATIONS AND REQUIREMENTS

The state of Florida has adopted the new Subpart X regulation. DER will review permit applications and issue permits. The temporary operation permit (TOP) held for Demolition Key was allowed to expire in 1986. In order to allow for continued disposal at the site, an application

for a TOP should be submitted prior to November 8, 1988. An application for an operation permit would also need to be submitted prior to that date. If new facilities such as open burning containment and a bunker are to be built, an application for a construction permit needs to be submitted also. If these applications are not made, then disposal at the site will be prohibited until an operation permit is applied for and issued which would probably take two to three years.

The Florida Resource Recovery and Management Act requires local governments which have jurisdiction over a proposed site, where treatment of hazardous waste shall occur, to determine whether or not the proposed site is consistent with and in compliance with adopted local government comprehensive plans, local land use ordinances, zoning ordinances or regulations, and other local ordinances. The Florida Environmental Law and Water Management Act of 1972 has specific statutes affecting the Florida keys.

The Florida Wetlands Protection Act protects wetlands within Outstanding Florida Waters. There are aquatic preserves in the immediate vicinity of Demolition Key. Appendix F discusses protected species which may inhabit those areas. Of special concern is that clearing the underbrush of the key may induce the Least Tern, which is protected by the state, to nest there. While the DER did not express any immediate restrictions on underwater testing and training activities, there is always the potential for stricter evaluations in the future because these activities occur in "Outstanding Florida Waters".

The Florida Hazardous Waste Facility Siting Regulations establish the criteria for siting hazardous waste facilities. The Florida Beach and Shore Preservation Act requires permits for anyone wishing to perform construction on or near a beach. There are no specific provisions in these statutes to prohibit siting an OB / OD facility on Demolition Key, and DER has not expressed any concern. However, its close proximity to an intracoastal waterway and a national wildlife refuge leave siting the facility in that location open to criticism.

C. LOCAL REGULATIONS AND REQUIREMENTS

The local Agricultural Extension office has to be contacted prior to clearing vegetation by burning.

D. NAVY REGULATIONS AND REQUIREMENTS

The Navy regulations and requirements are those given in NAVSEA OP 5 VOLUME 1, "AMMUNITIONS AND EXPLOSIVES ASHORE: SAFETY REGULATIONS FOR HANDLING, STORING, PRODUCTION, RENOVATION AND SHIPPING", CHAPTER 11, "DISPOSAL" and NASKW INSTRUCTION 8027.5C, 14 April 1987. These are discussed thoroughly in Section III.

V. IDENTIFY WHICH OPERATIONS WILL REQUIRE ENVIRONMENTAL PERMITS AND WHICH CAN BE CONDUCTED WITHOUT ENVIRONMENTAL RESTRICTIONS.

A. GENERAL

Any activity, whether it is covered by RCRA or not, is potentially subject to other environmental regulations. Appendix E contains an evaluation of all protected species in the area and their relationship to the activities at Demolition Key. The DER has indicated that at this time, air permits will not be required. However, the environmental assessment submitted with the Part B permit application will be evaluated for air permitting requirements at that time. Also, surface water regulations will be evaluated in the same manner.

B. TESTING

The materials used in the testing conducted for the Naval Air Development Center (NADC) is not a solid waste as is defined under 40 CFR 261.2 because it is being used for its intended purpose and is not being discarded, abandoned or recycled. However, as will be described later, if the testing generates a hazardous waste or a release from a hazardous waste disposal unit, then it will be subject to the provisions of 40 CFR 264, Subpart F - "Releases From Solid Waste Management Units".

C. TRAINING

Under 40 CFR 264.2(e)(ii), "Materials are not solid wastes when they can be shown to be recycled by being used or reused as effective substitutes for commercial

products". Since training would take place whether wastes were generated or not, commercial products would have to be used for training in the absence of waste material. If training was conducted with each disposal operation, it would not necessarily exempt all the material from being classified as a hazardous waste. In the past, when the amount of material substituted is exactly equal to the total raw material used, the EPA has considered such practices as "sham recycling". Specifically, this would be considered an attempt to bypass the RCRA regulations by disposing hazardous waste under the guise of training.

D. EMERGENCY

Certain materials are disposed at Demolition Key under emergency conditions, such as packages with unknown origins. Under 40 CFR 270.1(c)(3)(i), "a person is not required to obtain an RCRA permit for treatment or containment activities taken during immediate response to any of the following situations:

- (A) A discharge of a hazardous waste;
- (B) An imminent and substantial threat of a discharge of hazardous waste;
- (C) A discharge of a material which, when discharged, becomes a hazardous waste."

Any activities which are taken under these conditions are exempt from Part B permitting requirements but only while these explicit conditions exist.

VI. EVALUATE DEMOLITION KEY WITH RESPECT TO MEETING THE ENVIRONMENTAL PERFORMANCE STANDARDS AS IDENTIFIED IN 40 CFR 264.601 OF THE FEDERAL REGULATIONS.

A study of numerous Army open burning / open detonation sites was conducted and is referenced in the USAEHA guidance. This is the basis for many of the conclusions and recommendations in that publication. Excerpts from those studies are included in Appendix G. These sources along with information gathered during the visit to the proposed facility site are the basis for the following evaluations.

The proposed site has unique geological properties which blur the term, ground-water. The key is a man-made dredge spoil island made in the late 50's or early 60's. Continual detonation since that time has resulted in the formation of a navigable channel through the middle of the key. The surface of the island is only a few feet above mean sea level. Whatever ground-water that exists, is sure to be near the surface and hydraulically connected to the surface water which is sea water. This coupled with natural porosity of the soil means that any soil contamination would flow relatively quickly through the soil to the ground-water and into the surrounding surface water.

A. PREVENTION OF ANY RELEASES THAT MAY HAVE ADVERSE EFFECTS ON HUMAN HEALTH AND THE ENVIRONMENT DUE TO MIGRATION OF HAZARDOUS WASTE CONSTITUENTS IN THE GROUND-WATER OR SUBSURFACE ENVIRONMENT

The previous practice of open burning without secondary containment has the greatest potential for contaminating the ground-water. The flammables that are used to douse the explosives contain hazardous waste constituents and facilitate the transport of the constituents into the ground. The Army study showed that open burning sites had soils contaminated to an average depth of eighteen inches as compared to six inches for open detonation sites. Open burning sites with secondary containment showed virtually no soil contamination. The EOD has indicated that there is no reason why all future open burning could not be done with secondary containment.

The Florida DER has indicated that open burning without secondary containment would require both a detailed assessment and ongoing ground-water monitoring during both the operating life of the facility and during the post-closure care period (30 years). The decision to evaluate the need for ground-water monitoring for open detonation and open burning with secondary containment will be made subsequent to the submission of the Part B permit application during the notice of deficiency process. Therefore a detailed assessment should be postponed until that time. However, the need for a detailed assessment and ongoing monitoring of ground-water is likely to be required at all open burning / open detonation sites.

B. PREVENTION OF ANY RELEASES THAT MAY HAVE ANY ADVERSE EFFECTS ON HUMAN HEALTH OR THE ENVIRONMENT DUE TO MIGRATION OF HAZARDOUS WASTE CONSTITUENTS IN SURFACE WATER, WETLANDS OR ON THE SOIL SURFACE

Given the close proximity of the surface water to the ground-water, the previous discussion applies to soil and surface water. Underwater disposal has the potential to contaminate the surface water directly. At a minimum the results of laboratory reaction products and by-products would be needed for the assessment. The EPA and DER may also request a research, development and demonstration project to demonstrate the safety of the practice. As such, underwater detonation should be discouraged. Again, a detailed assessment and ongoing monitoring of soil and surface water will probably be required, but the decision to do so should be postponed until the notice of deficiency process.

C. PREVENTION OF ANY RELEASES THAT MAY HAVE ANY ADVERSE EFFECTS ON HUMAN HEALTH OR THE ENVIRONMENT DUE TO MIGRATION OF WASTE CONSTITUENTS IN THE AIR

The FDER indicated that they are not currently requiring air permitting for OB/OD operations. This indicates a relaxed attitude toward requiring ongoing monitoring. Given the relatively high destruction efficiency of the operation and the low on-stream time of the operation, total air emissions should be sufficiently low to avoid air monitoring. However, a detailed assessment will probably be required which will include computer modeling of the impact on the atmosphere and the surrounding environment. The detailed assessment for air should also be postponed until the notice of deficiency process when more specific requirements have detailed.

VII. IDENTIFY ANY PERMITS OR NOTICES REQUIRED FOR UNDERWATER EXPLOSIVES TESTING IN WATERS IMMEDIATELY SURROUNDING DEMOLITION KEY. PROVIDE A SUMMARY OF THE GENERAL PERMITTING PROCEDURES AND IDENTIFY THE REGULATORY AGENCIES THROUGH

WHICH THE PERMITS OR NOTICES WILL BE OBTAINED. EVALUATE THE COMPLEXITY OF PREPARING THESE PERMITS OR NOTICES IF THEY HAVE NOT ALREADY BEEN OBTAINED.

The Florida DER and the EPA have taken the position that testing through underwater detonation is not regulated through RCRA. They did not require that any other permitting for the process. However, any activity that adversely affects any protected species may be regulated or prohibited. Our study found no conclusive evidence that such a situation exists.

VIII. PROVIDE RECOMMENDATIONS AND ALTERNATIVES TO PERMITTING DEMOLITION KEY AS A HAZARDOUS WASTE OPEN BURNING / OPEN DETONATION UNIT.

For the explosive hazardous wastes that are proposed for disposal at Demolition Key, open burning or open detonation provides the greatest overall protection to human health and the environment. The vast majority of these materials are unsuitable for incineration because of their explosive nature.

Since the greatest threat that these wastes pose are uncontrolled explosions, materials handling and storage in a safe and competent manner is critical to protecting human health and the environment. These materials are being disposed because of their lack of dependability. No industrial group is as qualified as the Navy to handle, transport and dispose. Further, the Navy has an excellent safety record in this field over a long period of time.

Black powder can be neutralized by immersion in water. Bulk high explosives can be disposed by chemical destruction. Small quantities of initiating explosives, such as lead azide, can be disposed by chemical decomposition. While these methods are possible they would require additional treatment permitting and would not necessarily be any more environmentally beneficial.

The only other reasonable alternatives to open burning and open detonation at Demolition Key is dispose of the material in the same manner at another location. Either the waste could be shipped to another Naval facility or the NAS Key West disposal site could be relocated further out to sea further away from the wildlife refuges and the civilian population.

APPENDIX A

14 April 1987

NASKW FORM 8027/2 (Revised 4/87)
DEMOLITION RANGE USE NOTIFICATION

1. DATE OF OPERATION: _____
2. MUNITIONS TO BE DISPOSED OF: _____
3. WAIVER REQUIRED: _____. WAIVER RECEIVED: _____.
4. NOTIFICATION:

- a. THE FOLLOWING SHALL BE NOTIFIED 24 HOURS PRIOR TO SCHEDULED DEMOLITION OPERATIONS:

	DATE/TIME	CONTACT
(1) NASKW Weapons Officer Ext. 81-2653/2452 (BC)	_____	_____
(2) NASKW OPS Duty Officer Ext. 81-2770 (BC)	_____	_____
(3) Key West Tower 294-2549	_____	_____
(4) EODMU Four OPS Ext. 82-316 (T)	_____	_____

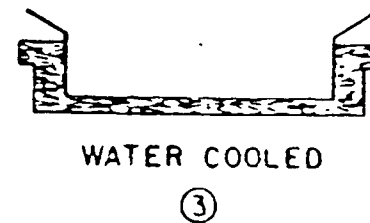
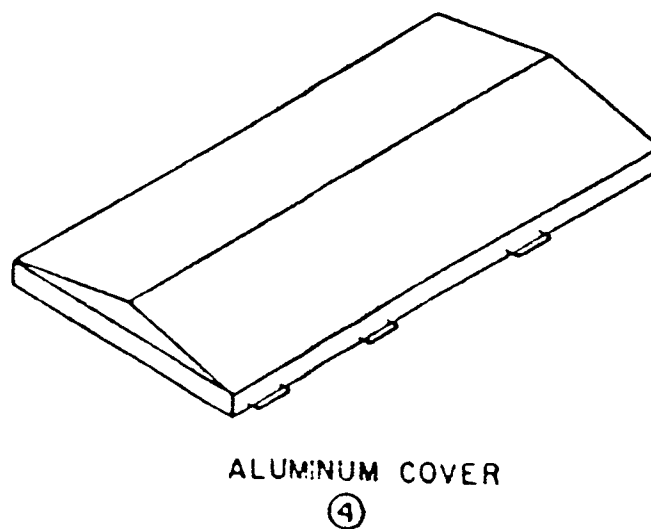
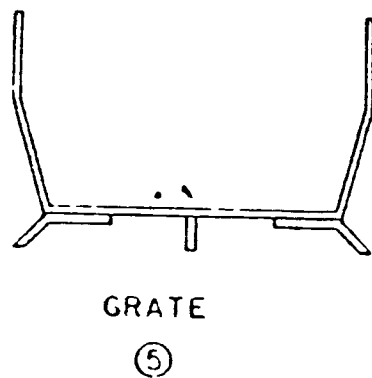
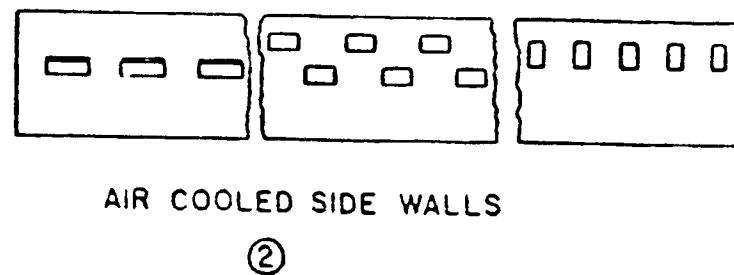
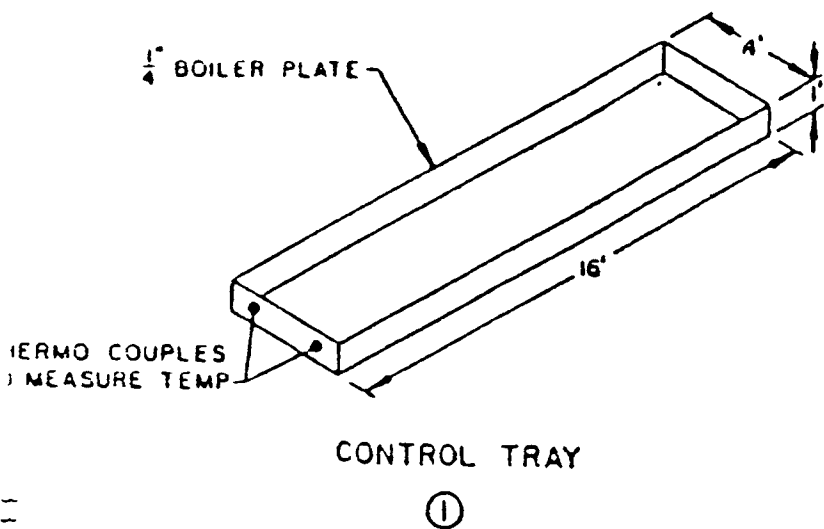
- b. The following shall be notified prior to 0800 on the day operations are to be conducted:

(1) EODMU Four OPS Ext. 82-316 (T)	_____	_____
(2) NASKW Weapons Officer Ext. 81-2653 (BC)	_____	_____
(3) Key West Tower 294-2549	_____	_____
(4) NASKW OPS Duty Officer Ext. 81-2770 (BC)	_____	_____
(5) NASKW OOD/JOOD Ext. 81-2268 (BC)	_____	_____
(6) Key West Police Dept. 294-2511	_____	_____
(7) Monroe County Sheriff Dept. 296-2424	_____	_____
(8) U.S. ARMY SPECIAL FORCES DET Ext. 341 (TP)	_____	_____
(9) U.S. COAST GUARD 294-3765	_____	_____
(10) U.S. FORCES CARIB COMMAND CENTER Ext. Ext. 82-405 (T)	_____	_____

- c. The following shall be notified upon completion of range operations:

(1) NASKW OPS Duty Officer Ext. 81-2770 (BC)	_____	_____
(2) NASKW OOD/JOOD Ext. 81-2268 (BC)	_____	_____
(3) Key West Tower 294-2549	_____	_____
(4) EODMU Four OPS Ext. 82-316 (T)	_____	_____

APPENDIX B



BURN TRAY TEST PROGRAM

APPENDIX C

**Environmental
Protection
Agency**

**Thursday
December 10, 1987**

Part IV

**Environmental
Protection Agency**

**40 CFR Parts 144, 260, 264, and 270
Hazardous Waste Miscellaneous Units;
Standard; Applicable to Owners and
Operators; Final Rule**

ENVIRONMENTAL PROTECTION AGENCY**40 CFR Parts 144, 260, 264, and 270**

(FRL 3220-1)

Hazardous Waste Miscellaneous Units; Standard; Applicable to Owners and Operators**AGENCY:** Environmental Protection Agency.**ACTION:** Final rule.

SUMMARY: The Resource Conservation and Recovery Act (RCRA) authorizes the Environmental Protection Agency (EPA) to issue standards applicable to owners and operators of hazardous waste management facilities. Over the past several years, the Agency has promulgated standards for specific types of treatment, storage, and disposal units, including containers, tanks, surface impoundments, waste piles, land treatment units, landfills, incinerators, underground injection wells, and research, development, and demonstration facilities. However, because some hazardous waste management technologies are not covered by the existing permitting standards, owners and operators of facilities utilizing them cannot obtain the RCRA permits necessary to operate them.

To fill this gap, the Agency is today promulgating a new set of standards under Subpart X of Part 264. The standards are applicable to owners and operators of new and existing hazardous waste management units not covered under the existing regulations. This will enable the Agency, and the States that adopt equivalent authorities, to issue permits to miscellaneous waste management units.

DATE: This final rule is effective January 11, 1988.

ADDRESSES: The official record for this rulemaking under docket No. F-87-SPXF-FFFFF is located at the U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460. It is available for viewing from 9:00 a.m. to 4:00 p.m., Monday through Friday, excluding holidays. The public should make an appointment to review docket material by calling (202) 475-8327. The public may copy a maximum of 50 pages of material from any one regulatory docket at no cost. Additional copies cost \$0.20 per page.

FOR FURTHER INFORMATION CONTACT: For general information, contact the

RCRA/Superfund Hotline at (800) 424-9346 (toll free) or (202) 382-3000 in Washington, DC. For information on the technical aspects of this rule, contact Kent Anderson, Land Disposal Branch, Waste Management Division, Office of Solid Waste (WH-565E), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, telephone (202) 382-4654.

Preamble Outline**I. Authority****II. Background**

- A. Development of the Hazardous Waste Regulatory Program
- B. Summary of the Need for Subpart X
- C. General Approach and Scope of Subpart X
- D. Comments Received on the Proposed Rule
 - 1. Specificity of Subpart X Standards
 - 2. Definition of "Miscellaneous Unit"
 - 3. Redefinition of "Landfill"

III. The Agency's Approach

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 - 2. Technical Performing Standards
 - 3. Containment Standards
 - 4. Facility-Specific Risk Assessment
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- B. Selected Approach for Subpart X Standards

- 1. Examples of Units Covered Under Subpart X
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 - f. Enclosed Buildings Used for Treatment, Storage, or Disposal
 - g. Research, Development, and Demonstration (RD&D) Units Covered Under § 270.65

IV. Amendments to Part 260: Definitions

- A. Miscellaneous Unit
- B. Landfill

V. Amendments to Part 264: Subpart X Regulation for Miscellaneous Units

- A. Section 264.600—Applicability
- B. Section 264.601—Environmental Performance Standards
 - 1. Ground-Water and Subsurface Migration
 - 2. Surface Water (Including Wetlands) and Surface Soils
 - 3. Air
- C. Section 264.602—Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action
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- VI. Amendments to Part 270: Permit Requirements
 - A. General Permit Requirements
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 - C. Conforming Changes
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 - A. Applicability of Rules in Authorized States
 - B. Effect on State Authorizations
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 - A. Regulatory Impact Analysis
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- X. Supporting Documents
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I. Authority

These regulations are issued under authority of sections 1006, 2002(a), and 3001 through 3013 of the Solid Waste Disposal Act (SWDA), as amended by the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C. 6901 *et seq.*

II. Background**A. Development of the Hazardous Waste Regulatory Program**

The Environmental Protection Agency is required by section 3004 of RCRA to establish standards for owners and operators of hazardous waste facilities in order to protect human health and the environment. These standards establish the duties of and provide the basis for issuing permits to the owners and operators of hazardous waste treatment, storage, and disposal (TSD) facilities under section 3005 of RCRA. Therefore, these standards serve not only to regulate the operations of these TSD facilities, but also to provide a basis for evaluating the issuance of these permits.

The Agency has promulgated these regulations in stages. On May 19, 1980 (45 FR 33221), the Agency issued regulations establishing administrative requirements for certain types of hazardous waste management, general provisions for facility owners and operators, permitting procedures for hazardous waste management facilities, and procedures for State program

authorization. On January 12, 1981 (46 FR 2802), the Agency issued regulations establishing technical standards and permitting requirements for certain storage and treatment facilities. On January 23, 1981 (46 FR 7878), and June 24, 1982 (47 FR 27516), the Agency issued technical standards for hazardous waste incinerators. On April 7, 1982 (47 FR 15032), and April 16, 1982 (47 FR 18544), the Agency issued regulations for demonstrating financial responsibility. On July 26, 1982 (47 FR 32274), the

Agency promulgated technical and permitting standards for new and existing TSD facilities on land, including surface impoundments, waste piles, land treatment units, and landfills.

On July 15, 1985 (50 FR 28702), the Agency amended its hazardous waste management rules to codify several statutory changes required by the Hazardous and Solid Waste Amendments of 1984 (HSWA). These changes included revisions to the technical requirements for land TSD

facilities, revisions to the permitting requirements for all TSD facilities, and limitations on the placement of hazardous waste in salt-dome formations, salt bed formations, underground mines, and caves. In addition, these amendments included new rules that allow for the permitting of certain research, development, and demonstration facilities.

These standards are presented in Table 1.

TABLE 1.—FEDERAL RULES PERTAINING TO THE MANAGEMENT OF HAZARDOUS WASTE

RCRA Code	Description
40 CFR Part 260	Basic regulatory definitions of what is covered under these standards.
40 CFR Part 261	Definition of a hazardous waste
40 CFR Part 262	Requirements for hazardous waste generators.
40 CFR Part 263	Requirements for hazardous waste transporters.
40 CFR Part 264	Establishes the permitting standards in the form of specific conditions for facility operation, design, performance, and location.
40 CFR Part 265	Establishes operational standards for existing facilities (on or before November 19, 1980) with "interim standards" until the site has obtained a final permit or it loses its interim status because of the provisions outlined under HSWA.
40 CFR Part 266	Establishes standards applicable to generators and transporters of materials used in a manner that constitutes disposal. This also includes standards for disposal of specific hazardous wastes where hazardous materials are used/recycled for recovery of heat, precious metals, and reclaimed batteries.
40 CFR Part 268	Sets treatment standards and schedules for prohibition of wastes for land disposal (including surface units, injection wells, salt domes, salt beds, underground mines or caves, or concrete vaults or bunkers)
40 CFR Part 269	Establishes permitting standards for control and monitoring of air emissions at TSDs.
40 CFR Part 270	Outlines definitions and basic requirements for RCRA permits.
40 CFR Part 271	Sets out the guidelines for final approval of State hazardous waste programs that will be used instead of the Agency's program.
40 CFR Part 124	Establishes the permit process to be followed under several Agency programs.

B. Summary of the Need for Subpart X

Although the Agency has issued regulations for the major hazardous waste management technologies and practices, gaps still remain. To close the gaps in the RCRA regulations and to cover unregulated hazardous waste management units, on November 7, 1986, the Agency proposed the Subpart X rule. Subpart X covers miscellaneous units and essentially completes the coverage of hazardous waste management units.

Currently, promulgated regulations in 40 CFR Parts 264 and 265 are the primary regulations for many types of hazardous waste management units as defined in § 260.10. These include containers, tanks, surface impoundments, waste piles, land treatment units, landfills, and incinerators. Research, development, and demonstration facilities and underground injection wells are regulated under Part 270 and the Underground Injection Control Program of the Safe Drinking Water Act (40 CFR Part 146), respectively.

The Agency is aware, however, that certain existing and future hazardous

waste management practices and technologies do not or may not fit the description of any of the units covered by the existing regulations. If they do not fit these descriptions, then they cannot be fully permitted and can only operate as interim status facilities. This is not desirable because it prevents the construction of new units or expansion of existing units. For example, thermal treatment of hazardous waste in units other than incinerators, boilers, or industrial furnaces may not be fully permitted because such units are not at present covered by Part 264 or Part 266. This means that existing units with interim permit status under Part 265 may not receive a full Part 264 RCRA permit. In addition, Part 264 permitting standards provide better environmental protection than the interim standards.

The Agency has received a number of requests that standards be issued to allow the construction of new hazardous waste management units not previously covered by Part 264. Furthermore, some types of new units that cannot now be constructed may reduce risks to human health and the environment from the management of hazardous waste.

Therefore, the Agency regards the Subpart X rule as a means of allowing flexibility for technological development and innovation.

C. General Approach and Scope of Subpart X

This regulation covers miscellaneous units not regulated under the standards for specific types of treatment, storage, and disposal units in Part 264 Subparts I through O or Part 146 or Part 270. Because these standards cover both existing and future treatment, storage, and disposal technologies, today's approach is to promulgate a new set of general standards that will cover diverse technologies and units. The Agency may develop specific technology standards in the future, if the need arises.

The Agency is regulating under today's rule most of those units that are not covered by a subpart under Part 264 or Part 146. For example, units that do not fit the definition of any of the units covered by the standards of Part 264 or Part 146 would be regulated as miscellaneous units. In addition, unless otherwise excluded, if a new type of unit

were developed that did not fit the definition of tank, container, surface impoundment, waste pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, or underground injection well, it would be regulated under Subpart X. An example of a miscellaneous unit would be a thermal treatment unit such as a wet-air oxidation device that is not an incinerator or a tank. Another example would be a long-term retrievable storage unit that is not a tank, waste pile, landfill, or other Part 264 unit, or an underground injection well. An example of a unit that will not be regulated under Subpart X, as explained in III.B.2., is open burning of nonexplosive wastes.

Subpart X will not supersede or replace any specific restrictions on activities contained in another subpart or provide a vehicle for escaping from those restrictions. For example, 40 CFR 264.175 stipulates that container storage areas must have a secondary containment system to drain and remove leakage. This requirement may not be evaded by seeking a permit under Subpart X.

Likewise, miscellaneous units permitted under Subpart X that are also defined by RCRA as "land disposal" units (see final rule at 51 FR 40572) may not avoid the Part 268 restrictions on land disposal of untreated or improperly treated hazardous waste. For example, although the use of an underground mine, cava, or formation for the placement of hazardous waste may, under some circumstances, be considered a miscellaneous unit, such a unit would also be subject to the Part 268 land disposal restrictions, since it is defined as "land disposal" by RCRA. Therefore, any hazardous waste subject to land disposal restrictions that is placed into a miscellaneous "land disposal" unit must be treated prior to land disposal in compliance with a treatment standard promulgated under Part 268, unless the owner or operator demonstrates, to a reasonable degree of certainty, that there will be no migration of hazardous constituents from the unit for as long as the waste remains hazardous.

D. Comments Received on the Proposed Rule

The 43 sets of public comments received on the November 7, 1986, proposal generally favored the implementation of Subpart X. The Agency considered all the public comments and categorized them into three general areas to provide a collective response:

- Specificity of Subpart X standards,

- Definition of "miscellaneous unit," and
- Redefinition of "landfill."

General responses to the first two categories appear below. In addition, the Agency discusses certain comments more specifically in later sections of the preamble.

Comments applicable to the redefinition of "landfill" are discussed in Section IV.B of the preamble. "Background Document. Subpart X Comments and Responses" contains all of the public comments that were received in accordance with the request for comments in the proposal and the Agency's response to these comments. This document is available in the Subpart X docket.

1. Specificity of Subpart X Standards

The Subpart X standards specify that health and environmental safety must be a primary concern during the management of hazardous wastes in miscellaneous units. The standards also require that existing regulations become an integral part of today's Subpart X standards for "miscellaneous" units. The Agency's intention of incorporating existing regulations with general Subpart X standards was the approach generally welcomed by the commenters.

The Agency has concluded that it is best to develop generic standards, not technology-specific standards, because the generic standards can cover a set of diverse technologies effectively. Most commenters have confirmed the need for such an approach. If the Agency developed technology-based standards, the Subpart X rule would not differ from the existing requirements in Parts 264 and 265. For most of the miscellaneous units, insufficient information is available to develop technology-based standards at this time. Even for those units for which there may be sufficient information available to develop technology-based standards, to do so would result in a major delay in permitting these units while standards were developed, proposed, and finalized. Therefore, the Agency chose to develop generic standards after considering the advantages and disadvantages of other approaches, including design and operating standards, technical and environmental performance standards, containment standards, and facility-specific risk assessment. Subpart X provides the Agency with flexibility in regulating miscellaneous units by providing generic permitting standards under Subpart X.

The Subpart X rule allows the hazardous waste management industry flexibility in developing new technologies or modifying existing

technologies. Public comments suggest that certain units, such as open burning/open detonation (OB/OD), physical/chemical/biological treatment units (e.g., pyrolysis, stripping, and in-situ biodegradation), and land-based hazardous waste disposal units (e.g., salt beds, salt domes, and underground mines or caverns), may require technology-specific standards. Some of these technologies are unique methods for managing specific types of hazardous wastes for which no alternative technology exists, and none of the existing permitting standards may be applicable. However, the Agency believes that the generic permitting standards under Subpart X would be just as applicable to open burning/open detonation, physical/chemical/biological treatment units, and land-based hazardous waste disposal units as any other Subpart X unit. Moreover, under Subpart X, the Agency has the flexibility to develop technology-specific standards for these units on a permit-by-permit basis when considering the technology-specific data submitted by the applicant to develop the permit conditions based on the environmental performance standards and to issue a permit.

A significant number of comments were received discussing different hazardous waste management technologies that the commenters considered should be eligible candidates for Subpart X permits. For a few technologies, extensive descriptions were submitted as part of the comment. For example, separate descriptions were submitted for each of these technologies: wet air oxidation, aboveground engineered vaults, enclosed buildings, in-situ biodegradation, in-situ vitrification, and open burning/open detonation of explosive wastes. The information obtained from these comments will be useful when the technology becomes widely used. At that time, the Agency will consider developing guidance or specific standards for those units included as miscellaneous units. As an example, the Agency is developing permit guidance for open burning/open detonation of explosive wastes.

A few commenters objected to the unlimited authority that Subpart X gives a permit writer when permitting a wide range of miscellaneous units. They saw this authority as a possible hindrance to the effective permitting of specific units.

The Agency agrees that there may be some cases in which permit writers must exercise some discretion. However, the Agency is developing permit guidance for certain types of units that will

provide assistance in the permitting process. While this guidance will not be binding on the Agency, and there still may be some permit variations between similar units, we believe that permit guidance will reduce any such variations by providing direction to permit writers and permit applicants, with regard to specific Subpart X technologies. For example, the Agency is developing specific Subpart X permit guidance for OB/OD and geologic repositories other than injection wells. This guidance will explain how to mitigate emissions or releases from these units and thus minimize long-term health and environmental hazards. As more experience is gained, the Agency may develop guidances on other Subpart X units. In addition, the Agency will use the support of EPA's Permit Assistance Teams (PAT) staff to promote nationwide consistency in the issuance of Subpart X permits. The PAT staff can also help the individual permit writer understand unfamiliar technologies.

Some commenters requested clarification on when ground water and/or surface water must be monitored at miscellaneous units. The Agency requires that when applying for a permit, the applicant must assess the potential for release or migration of hazardous constituent(s) to each of the media. Based upon this assessment, a determination will be made as to the type and frequency of monitoring that will be necessary at any specific unit or site.

2. Definition of "Miscellaneous Unit"

"Miscellaneous unit" is defined in the proposed Subpart X rule as a hazardous waste management unit that is used to treat, store, or dispose of hazardous wastes but that does not fit the current RCRA definition of container, tank, surface impoundment, pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, or underground injection well.

Most of the commenters suggested that the Agency should provide a list of technologies or units that can be categorized as Subpart X units. They believed this would avoid confusion over which units should be permitted under Subpart X. If such an all-inclusive list were published with today's rule, however, it would become quickly outdated because new technologies are being developed frequently. In response to commenters' requests, the Agency has provided examples of units in Section III, B.1 and 2, that are covered and not covered under today's rule. Since Subpart X is a catchall category, the list provided here is not all-inclusive and comprehensive.

Commenters also indicated that a definitive listing of all applicable units would circumvent the need for requiring two types of permits (e.g., a tank-like unit would not need both a tank permit and a Subpart X permit). They claimed that obtaining two permits is very costly and time consuming and often duplicates efforts. The Agency does not intend to require two permits for any miscellaneous unit. Under the regulatory approach selected today, a Subpart X permit would be issued for the miscellaneous unit, which may include certain requirements that are specific to other types of units. For example, for a miscellaneous unit resembling a tank, a Subpart X permit would be issued that would include certain of the Subpart J tank standard requirements.

3. Redefinition of "Landfill"

Comments applicable to the redefinition of "landfill" are discussed in Section IV.B of the preamble.

III. The Agency's Approach

A. Alternative Approaches Considered

In preparing the proposed Subpart X rule, the Agency considered a number of regulatory approaches. The Agency selected a combination approach since no singular approach was best suited to protect human health and the environment while still providing flexibility in addressing the diversity of waste management units included in Subpart X. Under this approach, appropriate elements of design and operating standards, technical performance standards, containment standards, facility-specific risk assessment, and environmental performance standards will be applied to miscellaneous units on a case-by-case basis. This approach will result in less delay by providing permitting standards for those miscellaneous units for which sufficient data are not available to develop more specific standards. The alternative approaches considered were design and operating standards, technical performance standards, containment standards, facility-specific risk assessment, environmental performance standards, and a combination of these approaches.

1. Design and Operating Standards

Design and operating standards would require the installation of specific equipment or the use of particular processes. These standards would be process- and unit-specific.

The majority of commenters favored these standards, since many were interested in obtaining specific requirements for their units. The Agency

determined that preparing these standards would be resource-intensive because it would need to collect extensive data on each specific type of unit. In addition to collecting the data, the Agency would need to develop a proposed rule and promulgate a final rule which would also greatly delay the permitting of miscellaneous units. Therefore, this approach would be a detriment to the development of innovative technology, since owners or operators would need to wait for EPA to promulgate new rules before applying for a permit.

Under today's approach, all miscellaneous units will be permitted under the general standards of Subpart X. Nevertheless, in the future, the Agency may develop specific design and operating standards for the various types of units, when there is a better understanding of the technology, process efficiency, and process safety needs.

One commenter who disagreed with the Agency, believed that the design and operating standards (or technical performance standards) for Subpart X units would be easy to implement. In contrast, another commenter agreed with the Agency's decision *not* to propose specific design and operating standards for miscellaneous units, because it would be impossible to regulate a new technology by predetermined design and operating standards that may or may not be appropriate for the individual unit in question. In addition, he further claimed that these predetermined standards could be more or less stringent than necessary to protect human health and the environment.

The majority of the commenters were concerned about the lack of specific design and operating standards for OB/OD facilities. They feared that omitting specific standards may lead to extensive delays and considerable expense in the permitting process. They were concerned that they may not be able to address completely the permit reviewers' requirements and may have difficulty obtaining a permit.

After reviewing the comments, the Agency believes that the promulgation of unit-specific design and operating standards is not necessary at this time. The generic standards, in conjunction with the permit guidance under development for OB/OD units, should provide sufficient information to develop permits without excessive delays. Moreover, the Agency is uncertain whether it possesses sufficient information to promulgate specific design and operating standards for OB/

OD units. Even if it had such information, the process of developing, proposing, and promulgating unit-specific standards for these units would cause major delays in issuing permits for these units. At some later date, the Agency may decide to develop specific design and operating standards for these units.

2. Technical Performance Standards

This regulatory approach would establish specific engineering objectives and allow the permit applicant to develop a design or set of practices to achieve these objectives.

One commenter indicated that it is difficult to define technical performance standards, since the technologies and associated "engineering objectives" will be continually refined. Another commenter suggested "establishing performance standards whereby a treatment operator would be required to demonstrate a degree of minimal acceptable variability in a treated product with respect to constituents of concern." A third commenter stated that the Agency should determine performance capabilities and establish specific levels of performance for thermal treatment devices (e.g., pyrolysis, calcination, wet-air oxidation, and microwave destruction). The Agency agrees with the first commenter mentioned above and has decided not to use this approach, because the specificity of the engineering objectives contained in technical performance standards could make permitting extremely difficult for miscellaneous units involving innovative technologies.

In response to the second commenter, the Agency agrees that certain technical performance standards could be developed to protect human health and the environment, however, a single set of these standards in all likelihood may not be suitable for all of the diverse types of miscellaneous units. Second, other than for possibly one or two technologies, the development of all technology-inclusive technical performance standards is not feasible because of (a) the lack of adequate data for setting standards and (b) the continued development of new technologies. In response to both the second and third commenters, for those units for which there possibly is sufficient information available to develop technical performance standards, these units could be excluded from the Subpart X rule. However, to do so would result in several years' delay in permitting these units while the standards are being developed, proposed, and finalized. However, in the future, specific standards may be

developed for certain types of units when adequate data become available.

One commenter proposed setting waste-specific standards rather than technical performance standards. The Agency rejected this suggestion, since waste-specific standards would create the same problems as discussed for the technical standards for innovative technologies. Moreover, insufficient data are available to develop waste-specific standards. As more information becomes available, however, the Agency may consider developing such standards.

3. Containment Standards

Another approach the Agency considered was the development of performance standards requiring containment of hazardous waste within certain boundaries. While such an approach may prevent environmental contamination under some hydrogeological conditions, the Agency is concerned that it may only delay containment in others. In addition, absolute containment in all media may not always be necessary to protect human health and the environment.

The Agency did not receive any support for this approach or any suggestions as to how this approach could be used for miscellaneous units. On a case-by-case basis, however, some permits issued under today's rule may be based on containment (for example, the containment features achieved by the design and operating standards for landfill units), such as liners and barriers or a combination of containment features and geological siting considerations.

4. Facility-Specific Risk Assessment

The Agency's evolving policy is to assess more explicitly the risks involved in its permitting and regulatory decisions. Under a facility-specific risk assessment regulatory approach, the permit applicant would be required to perform fate and transport analyses and human health and environmental risk assessments based on the RCRA goal of protecting human health and the environment. However, since the costs of risk analyses could be extremely high for miscellaneous units, and since the data available for estimating risks from Subpart X units are limited, this approach was not considered feasible as a sole regulatory approach.

Three commenters responded to this approach. They thought that facility-specific risk assessment would be expensive, time-consuming, inconclusive, and difficult to implement. In addition, they stated that there may not be enough data available to make

valid risk assessments. One commenter suggested that a comprehensive risk analysis should be required only when specific standards for other permitted operations or processes (e.g., wastewater discharges, air emissions) are unavailable.

The Agency agrees that using risk assessment as the sole approach is not appropriate for many of the same reasons identified by the commenters.

Today's approach assesses the risks from various releases and the potential emissions of hazardous constituents in a general way. Based on the assessment data submitted with a permit application, specific design and operating standards to mitigate the site-specific risks could be identified and incorporated during the permitting process.

5. Environmental Performance Standards

Environmental performance standards seek to set either the numerical health and environmental standards or the nonnumerical performance requirements necessary to protect human health and the environment. These standards may take the form of numerical exposure specifications (such as the allowable concentration of a chemical at the points of human exposure), pollutant concentrations permitted to be released to the environment, or general objectives or goals to serve as a guide for protecting human health and the environment.

The Agency views environmental performance standards as the most important feature of today's rule for new and existing miscellaneous waste management units. For example, existing environmental performance standards for air and water may be utilized, as appropriate, in permitting a facility. Section 3005 of RCRA requires that standards applicable to owners and operators of treatment, storage, and disposal facilities be those "necessary to protect human health and the environment."

If this approach was selected as the sole approach, however, then it might be difficult for permit applicants of certain types of miscellaneous units to consistently demonstrate compliance with these standards. For example, with the open burning/open detonation technology, emissions monitoring is not feasible. Thus, it would be difficult to demonstrate compliance with an established performance standard. For the same reason, enforcement of these standards for certain units might be difficult. In addition, this approach was not selected as the sole approach

because the existing performance standards for air and water do not address all constituents of concern under RCRA Subtitle C.

One commenter questioned the need for special performance evaluations under Subpart X. This commenter noted that air emissions and effluent standards are now required for more conventional technologies that could be applied to most Subpart X thermal, chemical, and biological treatment units, with the exception of open burning/open detonation of explosive wastes. In addition, the commenter asserted that treatment standards for the land disposal restrictions will apply to Subpart X units and, therefore, should reduce requirements for special operating and environmental standards.

The Agency disagrees with these comments. EPA foresees the need for special performance evaluations because the existing air and water standards, when applied to certain Subpart X units, may provide inadequate protection to human health and the environment since they do not address all constituents of concern under RCRA Subtitle C. As stated earlier, the existing applicable standards and any additional requirements specific to a given unit will minimize the health and environmental risks.

Environmental performance standards part of today's approach allow flexibility in meeting goals for the protection of human health and the environment. The flexibility offered by this approach is needed in Subpart X because of the variability of miscellaneous units.

6. Combination of Approaches

This approach combines the appropriate elements of all five previously discussed alternatives, and applies them on a case-by-case basis. Several commenters supported this approach as providing flexibility for innovative technologies. One commenter, however, stated that the units included in Subpart X were so diverse that one general rule may be difficult to apply. But the Agency believes that the diversity of existing units and the need to include potential future technologies necessitate a general rule that can be applied on a case-by-case basis.

B. Selected Approach for Subpart X Standards

After evaluating the various alternatives, the Agency selected the proposed combination approach without modification for today's rule for miscellaneous units. This approach is based on appropriate elements of all

five alternatives discussed above and will be applied to miscellaneous units on a case-by-case basis. Under this approach, miscellaneous units will be required to be located, designed, constructed, operated, maintained, and closed in a manner that will prevent any release that may have adverse effects on human health or the environment due to migration of waste constituents into the ground water or subsurface environment; surface water, wetlands, or soil surface; or air.

The Agency has decided to use Subpart X standards to regulate all units that are not currently included elsewhere under RCRA. These include, but are not limited to, (a) placement of hazardous waste in geologic repositories other than injection wells; (b) placement of hazardous wastes in deactivated missile silos, other than injection wells or tanks; (c) thermal treatment units other than incinerators, boilers, or industrial furnaces; (d) units open burning and open detonating explosive wastes; and (e) certain chemical/physical/biological treatment units. The units that are excluded from Subpart X include: (a) units currently regulated under other portions of Part 264; (b) units open burning nonexplosive hazardous wastes; (c) units excluded from permitting under Parts 264 and 270; (d) certain mobile units; (f) enclosed buildings for treatment, storage, or disposal; (e) underground injection wells (40 CFR 146); and (g) RD&D units covered under 270-65.

Units covered under today's rule will comply with standards that provide performance objectives for protection of human health and the environment. The performance objectives require permit applicants to evaluate the potential environmental impacts of the unit or facility and to demonstrate that any releases from the unit will not adversely affect human health or the environment.

For technologies where (1) a particular hazardous waste management system resembles another type of unit for which EPA has promulgated standards and (2) the permit applicant has identified the differences between the potential effects on human health and the environment posed by the two units, the use of site-specific design, operating, monitoring, and containment procedures modified to account for the differences must be developed and, therefore, will be required parts of the facility permit. Generally, these standards will be drawn from existing regulatory requirements and guidance documents, as well as permit guidance being developed for specific types of miscellaneous units. For units that do not resemble another type of unit, the

applicant must still address the unit's effect on all media, and, where appropriate, specific requirements applicable to other types of units will be added to the facility permit.

In the permitting process, selected features of design and operation, technical performance, containment, and environmental performance standards, as well as the risk-based assessment, will be specified, so that the overall objective of protecting human health and the environment is achieved. Determination of the appropriate requirements will be made on a case-by-case basis and the rationale for their applicability will be provided in each permit. In certain cases, the design and operation of a Subpart X unit may resemble that of a specific type of unit now regulated under RCRA (e.g., a landfill). To the extent that they are similar, the appropriate requirements under the existing unit-specific subparts will be applied. For example, for some units, liners may be specified.

The regulatory approach finalized today by the Agency offers several advantages. First, it allows the Agency to address a full range of environmental issues raised by any waste management situation without waiting to establish specific design and operating conditions or other standards. By identifying several sets of environmental performance standards in today's rule, the Agency allows development of waste- and site-specific permits responsive to various ground-water, surface water, and air quality concerns, as well as complex natural processes in the surface and subsurface environments that may arise at each site. The Agency will also apply the authority of section 3005(c)(3) "omnibus" to other Part 264 hazardous waste management units as necessary to protect human health and the environment.

Second, for those Subpart X units requiring compliance with the standards developed for a specific medium, appropriate portions of the existing standards will be incorporated into the permit as required by today's rule. For example, in regulating air emissions from pyrolysis units, the Agency will incorporate the applicable portions of existing standards (e.g., incineration standards for meeting the air quality standards).

The Agency has concluded that it is not possible to set design and operating standards for all of the potential Subpart X units, since a variety of units will be covered by today's rule. One set of standards either will not be stringent enough or will be excessively stringent

when applied to these diversified technologies. Subpart X will cover a number of technologies for which little or no information is available; hence, the Agency's decision not to set technology-based standards. However, the site and unit-specific information submitted during the permitting process for individual units will allow the permit-issuing authority to tailor each permit to the particular risks and circumstances based on the nature of the technology, the types of wastes, the site location, and the regional meteorological, climatic, and hydrogeological characteristics. For example, in the case of innovative technologies, data collected under a RD&D permit may be submitted when risk assessment data are not available.

A comprehensive evaluation as required by today's rule will provide assurance that the permitted miscellaneous unit poses a minimal environmental threat. However, situations may arise when the Agency must deny a permit or defer a decision until additional data become available. Under certain circumstances, to obtain the additional data, a research, development, and demonstration permit might be appropriate. In cases where the permit application must be denied, the Agency will follow the procedures for the Notice of Deficiency (NOD) under 40 CFR 124.3.

The major disadvantage of the proposed approach is that the bulk of the design, construction, operation, monitoring, and closure specifications will be developed and specified through the permit process. As discussed above, the Agency will review and adopt or modify relevant requirements from Subparts I through O of Part 264, as appropriate. As more permitting or research experience and knowledge are gained, the Agency may develop guidances for specific types of facilities to aid the permit applicant and writer (e.g., the Agency is preparing guidance on open burning and open detonation of explosive wastes and on emplacement of wastes in certain massive geologic formations such as salt domes). In addition, the Agency will provide assistance to a permit applicant or writer.

1. Examples of Units Covered Under Subpart X

Because the Agency intends Subpart X to cover "miscellaneous" units, including future technologies, a definitive list of the units that will be covered under the subpart cannot be provided. However, the Agency agrees that it will be helpful to identify several

types of units that may receive permits issued under Subpart X.

a. Placement of Hazardous Waste in Geologic Repositories. Placement of containerized hazardous waste or bulk non-liquid hazardous waste in geologic repositories such as underground salt formations, mines, or caves, either for the purpose of disposal or long-term retrievable storage, is included under Subpart X. Clarification of units that are regulated under the RCRA permit-by-rule for injection wells with Underground Injection Control permits is included in III B.2 (e) of the preamble.

Restrictions on land disposal of hazardous waste imposed by sections 3004(d) through (m) of RCRA apply to these units. These standards dictate that restricted hazardous wastes cannot be disposed of on land beyond specified dates, unless they are treated in compliance with Agency-established treatment standards or unless EPA grants a variance that demonstrates that there will be no migration out of the unit for as long as the wastes remain hazardous.

b. Placement of Hazardous Waste in Deactivated Missile Silos. Treatment, storage, and disposal of hazardous waste in deactivated missile silos that are not underground injection wells or are not covered under Part 264 standards will be covered under Subpart X. However, to the extent that the deactivated missile silo meets the regulatory definition of an injection well or tank it would be regulated under 40 CFR Part 148 or Part 264, respectively. Clarification as to units that are regulated under the RCRA permit-by-rule for injection wells with Underground Injection Control permits is included in III B.2(e) of the preamble.

c. Thermal Treatment Units Other Than Incinerators. A number of different types of thermal treatment units, including combustion and noncombustion types, are in operation today and have potential application to hazardous waste treatment. Combustion and noncombustion units such as molten salt pyrolysis, calcination, wet-air oxidation, and microwave destruction, which are not covered under Part 264 Subpart O regulations will be covered under Subpart X. Many of these units have not yet operated on a commercial scale, but owners of some of these units are expected to seek RCRA hazardous waste facility permits for commercial operation in the future.

d. Open Burning/Open Detonation of Explosive Wastes. These units (as defined in § 265.362) are neither typical thermal treatment units nor incinerators. The Agency promulgated interim status

standards applicable to open burning and open detonation units in Subpart P of Part 265 (§ 265.382 on May 19, 1980 (45 FR 33251)). These standards require (1) that units be operated in a manner that does not threaten human health and the environment and (2) that a minimum safe distance from other properties be maintained when waste explosives are disposed of by open burning or open detonation. Permitting of hazardous waste management units for open burning or open detonation of waste explosives is covered in the Subpart X rule. When upgrading existing units or permitting new units, the applicable portions of Part 265 Subpart P standards (e.g., minimum safe distances) will be incorporated during issuance of Subpart X permits. Because OB/OD is a treatment process, it is not subject to the land disposal restrictions imposed by sections 3004 (d) through (m) of RCRA.

e. Certain Chemical, Physical, and Biological Treatment Units. Hazardous waste management units that treat hazardous waste by chemical, physical, or biological methods in units other than tanks, surface impoundments, and land treatment units during interim status are covered under Subpart Q of Part 265. The Subpart X regulations of Part 264 and the applicable portion of Subpart Q of Part 265 will be considered in permitting these units. Under the land disposal restrictions, no *in-situ* hazardous waste treatment on land will be permitted (without the *prior* use of a best demonstrated available technology (BDAT) for treatment). Therefore, none of the *in-situ* treatment methods will be Subpart X units/technologies.

2. Examples of Units Not Covered or Units for Which Subpart X Permits Will Not Be Issued

a. Treatment, Storage, and Disposal in Units Currently Regulated Under Part 264. Under today's rule, treatment, storage, or disposal in units now regulated under Part 264 may be permitted only under the applicable subparts of Part 264. For example, placement of hazardous waste in a tank or surface impoundment for treatment is covered under Subpart J or Subpart K, respectively, and disposal of hazardous waste in a tank is covered under Subpart N, and must be permitted using those standards.

b. Open Burning of Nonexplosive Hazardous Waste. Although by its terms Subpart X applies to all units not covered under Part 264, including open burning and open detonation of nonexplosive hazardous waste, the Agency has concluded that open burning of such non-explosive waste cannot be

conducted in a manner that is protective of human health and the environment.

Agency made this finding in 1980 in promulgating the general ban on open burning of nonexplosive hazardous waste (40 CFR 265.382) and has no new information to suggest this conclusion should be revised. The Agency, therefore, intends to deny any permit applications it receives under Subpart X for such activities.

c. Units Excluded From Permitting Under Parts 264 and 270. Certain units are specifically excluded from permitting under the Part 264 and Part 270 standards. For example, publicly owned treatment works and ocean disposal activities are not permitted under Part 264 standards, since they are covered by permits-by-rule (see 40 CFR 264.1 (c) and (e)). Another example is operation of a wastewater treatment unit (40 CFR 264.1(g)(6)). These units continue to be excluded from Part 264 standards and would not be subject to Subpart X.

d. Mobile Units. Mobile waste management units are becoming available and may be used for treatment of hazardous wastes as part of a general waste treatment strategy or on a short-term basis to destroy specific wastes for remedial site cleanup, spill control, and other types of emergency responses.

These units are presently regulated under 40 CFR 264 and 270, and certain changes to the permit requirements have been proposed and are currently being evaluated by the Agency. These units may also be involved in research, development, and demonstration activities and, as such, may be covered by a research, development, and demonstration permit.

Mobile units using technologies that are covered under other subparts of Part 264, such as incineration or treatment in containers, are excluded from Subpart X. However, those units included in Section II.B.1., which are mobile, are covered under today's rule.

e. Placement of Hazardous Waste Underground That Is Currently Regulated Under Part 146. RCRA Subpart X permitting will not apply where EPA has an existing permit program which addresses the particular hazardous waste management practice. It is thus necessary to outline those waste management practices currently covered by the underground injection control (UIC) program. Hazardous waste injection is regulated under the authorities and mandates of both the Safe Drinking Water Act (SDWA) and RCRA. Wells must have authorization under both acts to operate.

Authorization-by-rule under 40 CFR 146.1 or a UIC permit under 40 CFR 144

Subpart D provides the SDWA authorization for hazardous waste wells. Interim status under 40 CFR 205.430 or a RCRA permit-by-rule under 40 CFR 270.60(b) provides the RCRA authorization. This permit system is in place for the injection in bulk form of liquids, slurries, and sludges. Technical standards for these practices are in 40 CFR Part 146.

These current technical standards, however, do not fully address some potential disposal or storage practices that may fall under EPA's regulatory definition of well injection. EPA defines "well injection" in 40 CFR 144.3 and 146.3 as the "subsurface emplacement of fluids through a bored, drilled or driven well; or through a dug well, where the depth is greater than the largest surface dimension." EPA defines "fluids" in 40 CFR 144.3 and 146.3 as "material or substance which flows or moves whether in a semisolid, liquid, sludge, gas or any other form or state."

A broad reading of these definitions might suggest that granular hazardous waste poured into a salt dome, for example, would be within the scope of the UIC program. The very recent opinion in *NRDC v. EPA*, Cons. Cases No. 85-1915 and 86-1096 (1st Cir., July 17, 1987) contains language suggesting extremely broad interpretations of the scope of the UIC program. This opinion remands regulations for the disposal of high level radioactive waste, spent nuclear fuel, and transuranic wastes at 40 CFR Part 191 which were promulgated under the mandates of the Nuclear Waste Policy Act of 1982 (NWPA) and the authority of the Atomic Energy Act of 1954. Some of the legal analysis, however, concerns interpretations of "well injection" and "fluids" under the SDWA. The opinion suggests that containers or solids lowered down a shaft would be "well injection" of "fluids" if contaminants in this material might ultimately "flow" or move into the accessible environment (Slip-Opinion at page 29). The court was particularly concerned that EPA had not evaluated the relationship of the SDWA and NWPA.

We are currently evaluating the legal analysis in this opinion and will address the specific issues of these definitions at a later date. However, EPA believes that it can address the issue of RCRA Subpart X and UIC permitting at this time for the range of long-term retrievable storage and disposal practices. Part 146 technical standards do not currently address practices other than the injection of noncontainerized liquids, slurries, and sludges. Other management practices, such as the placement of containerized wastes or

solids, would require standards on a case-by-case basis. EPA intends the environmental objective for these latter practices to be the same, such as will meet the requirements of the SDWA and RCRA, whether a particular practice is termed to be "underground injection" or not. Specifically, in the context of this regulation, the Agency intends to apply the mandate of the SDWA to prevent the endangerment of underground sources of drinking water, as is consistent with RCRA's mandate to protect human health and the environment.

This final rule provides that the Director apply standards for these miscellaneous management practices through the RCRA Subpart X permit. RCRA permit procedures provide at least as much public participation as the UIC permit procedures and are thus, a fully appropriate vehicle to impose standards whether solely under the authority of RCRA or under the combined authority of RCRA and the SDWA (See 40 CFR Part 124). The final rule, therefore, contains amendments to 40 CFR Part 144.31 which requires that a Subpart X permit will constitute a UIC permit for hazardous waste well injection for which current Part 146 technical standards are not generally appropriate. In promulgating this amendment to § 144.31, we are not specifying that these miscellaneous management practices constitute underground injection, but rather, to the extent any of these practices may be determined to be underground injection § 144.21 will authorize a facility under the SDWA if the unit has a RCRA Subpart X permit.

The above permitting scheme does not, in and of itself, remove the restrictions on the placement of noncontainerized or bulk liquid hazardous waste in any salt dome formation, salt bed formation, underground mine, or cave under section 3004(b)(1). That provision requires the Administrator to find, after notice and opportunity for hearings on the record in the affected areas, that such placement is protective of human health and the environment to remove the prohibition. "Fluids" under the UIC program are "liquids" under § 3004(b) when they do not pass the Paint Filter Liquids Test contained in Method 9005 of the "Test Method for Evaluating Solid Wastes, Physical/Chemical Methods" [EPA Publication No. SW-8461].

f. Enclosed Buildings Used for Treatment, Storage, or Disposal. The Agency is considering under separate action the appropriate mechanism to permit activities in enclosed buildings.

While this does not rule out the possibility that these units could be permitted under Subpart X, no decision has been made at this time.

g. *Research, Development, and Demonstration (RD&D) Units Covered Under § 270.65.* The purpose of an RD&D permit is to allow for testing and demonstration of innovative and experimental technologies, including the modification of existing technologies. If a unit meets the requirements of an RD&D permit under § 270.65, then that unit will not be eligible for a Subpart X permit.

IV. Amendments to Part 260: Definitions

After evaluating the public comments and current definitions of Part 260, the Agency has added a new definition for "miscellaneous unit," and has amended the "landfill" definition.

A. Miscellaneous Unit

Today the Agency defines the term "miscellaneous unit" to refer to hazardous waste management units used to treat, store, or dispose of hazardous wastes that do not fit the current definition of container, tank, surface impoundment, pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, underground injection well with appropriate technical standards under 40 CFR Part 146, or unit eligible for an RD&D permit under § 270.65.

None of the commenters suggested specific definitions for "miscellaneous unit." They did, however, address several units or processes that they believe should or should not be included as miscellaneous units. One commenter stated that the definition of "miscellaneous unit" is too broad and that the Subpart X standards along with this definition may further encumber the already overburdened RCRA permitting process. On the other hand, another commenter indicated that the definition of "miscellaneous unit" is adequate, provided the existing expansive definition of "landfill" is appropriately limited.

Two commenters requested clarification. One suggested that enclosed buildings should not be considered waste piles or tanks and, therefore, should be considered miscellaneous units. The other stated that clarification is necessary to avoid possible confusion between open burning/open detonation units and waste piles and other types of units.

An additional commenter suggested that "open burning," as defined in 40 CFR 260.10, does not accurately define the nature of the reaction that occurs at facilities treating explosive wastes.

Another commenter proposed that the definition of "open burning" be amended to include "detonation" and "deflagration." A few commenters suggested that the Agency define the types of wastes that can be burned or detonated in open burning/open detonation units.

In general, it appears that some of the commenters believe that a clear definition and understanding of "miscellaneous unit" is essential to meet applicable permitting requirements under Subpart X without undue delays. Second, commenters requested a definitive list of units, processes, or technologies that can be considered "miscellaneous units" under Subpart X in order to minimize any confusion in the permitting process that may result from this regulation.

Through both the definition and the discussion in this preamble, the Agency has made it clear what is meant by a "miscellaneous activity" and what units can be eligible candidates for Subpart X permits. The Agency concluded that by making the definition of "miscellaneous unit" broad, it allows the owner or operator and the regulatory authority to incorporate all types of units not previously covered under Part 264. In the preamble, we have attempted to further clarify the types of units that are covered and not covered under Subpart X by giving various examples under each category. However, an all-inclusive list of units covered by Subpart X is not provided. To do so would require amending the regulation each time a new process is developed. This would greatly delay the permitting of such units.

B. Landfill

Today's rule defines "miscellaneous unit" as a catchall category. Previous to today's change, landfills as defined in 40 CFR 260.10 covered certain units that did not fit within the definition of other land disposal units. Under that provision, "landfill" meant "a disposal facility or part of a facility where hazardous waste is placed in or on land and which is not a land treatment facility, a surface impoundment, or an injection well." Therefore, "landfill" was a catchall category for all disposal facilities that did not meet the definition of a land treatment facility, a surface impoundment, or an injection well. The use of the term "miscellaneous unit" as the catchall category requires redefining "landfill" so as to limit it to a discrete category of specific units covered under Subpart N of Part 264. Therefore, in the Subpart X proposal, the Agency requested comments on how to clarify

the landfill definition such that it no longer constituted a catchall category.

After considering all of the comments received on this issue, the Agency has decided to define the term "landfill" similar to the definition in § 260.10 with a few minor modifications. Under today's rule, the Agency has defined the term "landfill" to mean a disposal facility or part of a facility where hazardous waste is placed on or in land and which is not a land treatment facility, a surface impoundment, an injection well, a pile, a salt dome formation, a salt bed formation, a cave, or a mine.

In the proposed rule, the Agency requested comments specific to the redefinition of "landfill". After a careful review of all the comments, the Agency decided not to significantly change the previous "landfill" definition but rather to clarify those units that are classified as "landfill" facilities.

A significant number of comments were received on the proposal to revise the existing "landfill" definition. The majority of these comments addressed the adequacy of the proposed goal to identify more precisely the types of waste management practices included within this category. The Agency has accomplished this goal by listing additional practices that are either included in or excluded from the definition.

A "disposal facility", as defined in § 260.10, means a facility used for intentional placement, where waste will remain after closure. This distinguishes storage and treatment in tanks from disposal facilities. However, it also allows the placement of wastes in tanks and vaults used for disposal provided the unit meets the landfill standards.

The new "landfill" definition provides that piles are not landfills. When "landfill" was defined in 1980, it was clearly the intent of the Agency to exclude piles. By amending our landfill definition to reflect this fact, we are simply clarifying the scope of the definition.

In the 1984 Hazardous and Solid Waste Amendments (HSWA) to the Solid Waste Disposal Act, Congress recognized salt dome formations, salt bed formations, caves, and mines as separate types of hazardous waste facilities or units and in section 3004(b) directed the Agency to develop standards for these units. If these units were already covered by the landfill standards, this would be unnecessary. Similarly, under section 3004(k) of HSWA, the types of units covered by the land ban are separately listed as landfills, salt dome formations, salt bed

formations, underground mines, caves, etc. Clearly, Congress did not intend these units be covered by the term "landfill."

"Landfill" will cover tanks or vaults used for disposal of hazardous waste. Subpart J of Part 264 only regulates storage and treatment in tanks and the Agency to date has not developed specific standards for disposal of hazardous waste in tanks. However, under limited circumstances, the Subpart J standards do allow treatment or storage tanks that cannot remove all contamination at closure to close and to perform post-closure care in accordance with the closure and post-closure requirements for landfills. Disposal in tanks will be regulated under the Subpart N standards as a landfill because "landfills" and the disposal of hazardous waste in tanks raises similar human health and environmental concerns and because tanks are similarly placed on or in the land. This does not result in a change in the way tanks used for disposal are regulated, since previous to today's rule the landfill category constituted a catchall category for disposal units not regulated elsewhere.

By changing the "landfill" definition, the Agency has not changed the status of those facilities that were previously considered to be "landfills". Rather, the Agency has clarified the previously described scope of the definition. Consequently, this change has not reduced the scope of facilities covered under either the land ban provisions of section 3004(d) of HSWA or the minimum technology requirements of section 3004(o) of HSWA.

V. Amendments to Part 264: Subpart X Regulation for Miscellaneous Units

The regulations promulgated today under 40 CFR Part 264 apply to miscellaneous waste management units that are used to treat, store, or dispose of hazardous waste. Conforming changes to accommodate the addition of Subpart X are provided for in Part 264, Subparts B, R, F, G, and H. These changes merely serve to make the general requirements of Part 264 applicable to miscellaneous units.

The Agency intends the general facility requirements of Part 264, Subparts A through E, G, and H, to apply to miscellaneous units. In addition, although the Agency made an oversight in the proposed rule, under today's final rule the corrective action requirements of section 3004(u) that were codified at 40 CFR 264.101 automatically apply to miscellaneous units. The Subpart F ground-water protection requirements will apply

somewhat differently to miscellaneous units compared to the conventional types of units. For miscellaneous units, Subpart F requirements under § 264.101 for corrective action will always apply. However, the requirements under § 264.91 through 264.100 for monitoring and response action programs apply only to those units that have a potential for contamination of ground water. These standards will apply on a case-by-case basis through the new § 264.602, which is explained below.

It should be noted that the term "Director" has been substituted for "Regional Administrator." "Director" means the Regional Administrator or the State Director in an authorized State, as the context requires. This change conforms to the terminology selected for use in other recent amendments to the hazardous waste management regulations.

The promulgated standards for miscellaneous units are discussed below, section by section.

A. Section 264.600—Applicability

This section limits the applicability of the regulations of Subpart X to owners and operators of miscellaneous hazardous waste management units. By using the term "miscellaneous," this section incorporates the definition of "miscellaneous unit" from § 260.10.

B. Section 264.601—Environmental Performance Standards

The most important features of the regulations for new and existing miscellaneous waste management units are the environmental performance standards set forth in § 264.601. Section 3004 of RCRA requires that standards applicable to owners and operators of treatment, storage, and disposal facilities be those "necessary to protect human health and the environment." In § 264.601, the Agency has translated this overall goal into a set of objectives that provide a guide for owners and operators of miscellaneous units and for permit writers. Those objectives are to protect ground water, surface water (including wetlands), air quality, and soil, which are the principal pathways for migration of hazardous constituents to receptors. While each of these objectives must be addressed in the permit, a permit may not need to specify conditions that protect each of these environmental media.

Most of the commenters suggested that the environmental performance standards, if made unit-specific, would aid in protecting human health and the environment from releases of contaminants. Other commenters objected to the requirement for detailed

ground-water, surface water, and air quality assessments, especially for facilities using technologies where it is unlikely that the waste or its constituents would come in contact with water, soil, or air media. As stated in the preceding paragraph, an assessment must be conducted for each medium, however, if the assessment shows that there will be no impact on a given medium, the permit need not specify conditions to protect that medium.

Another commenter said that these standards are geared to toxic wastes. The commenter further indicated that, in the case of explosive wastes, there will be a poor fit between these regulatory requirements and a particular unit. The commenter stated that ground-water migration is unlikely during open burning of explosive wastes. The performance standards require that an assessment be conducted for each of the media. If the assessment shows that, in this case, ground water will not be impacted, then the permit need not specify conditions to protect the ground water.

The Agency, however, does not feel that it is appropriate to promulgate specific environmental performance standards at this time. Given that miscellaneous units will be regulated by issuing individual permits that are unit- and site-specific, human health and the environment can be protected without being overly stringent in some cases and/or too lenient in others. It is expected that the unit-specific environmental performance standards defined in Subparts I through O will provide baseline, acceptable protection and, at the same time, will allow flexibility in issuing case-by-case variation during the permitting under the Subpart X regulation. In addition, the Agency is developing unit-specific guidance for certain units and may, in the future, provide additional technology-specific guidance, if necessary.

The Agency does not view § 264.601 as a set of specifications that will directly apply to all owners and operators of miscellaneous units. Rather, § 264.601 provides a general set of objectives that will guide the permit applicant (owner or operator), the Agency, and the public in evaluating the acceptability of each unit and the adequacy of the unit design and operation to mitigate risk. The permit applicant is expected to propose the specifications for location, design, construction, operation, monitoring, maintenance, closure, and, where appropriate, post-closure care based on

supporting data and information on the specific unit.

Detailed analysis of each factor in § 264.601 may not be necessary in a permit application, depending on its relevance to the type of unit under consideration and the associated health and environmental risks. For example, certain completely enclosed biological, physical, or chemical treatment units may not require permit conditions imposing monitoring requirements for air or ground water. On the other hand, specific thermal treatment units covered under this subpart may require extensive air monitoring. All of the factors identified in § 264.601, however, should be considered and their relevance should be addressed in the application.

Based on the information about the environmental impacts, specific conditions beyond those suggested by the applicant may be included by the Agency in the permit. Once issued, the permit governs where a unit is to be located and how it is to be designed, constructed, operated, monitored, maintained, and closed.

Few comments were received on each environmental medium—e.g., ground-water migration, surface water and soils, and air. The majority of commenters elaborated on their concerns related to the hazard assessment and the need for controls under the broad category of environmental performance standards. The commenters indicated that they favored development of Subpart X permitting standards because they provide flexibility for developing unit- and/or site-specific assessments of contamination of specific media in the permitting process.

The Agency below discusses what factors should be considered by applicants and permit writers in assessing the potential for adverse effects on each medium. These factors include the type of waste managed, the types of technologies, the types and quantities of emissions or releases, and the extent of migration or dispersion of the waste in various media. The permit applicant must submit information on these assessments, which must be included in the permit in order to be considered as a complete permit application. These assessments must be in sufficient detail to support the applicant's position in demonstrating minimal impact and/or minimizing adverse impacts on each medium.

1. Ground-Water and Subsurface Migration

Section 264.601(a) lists several factors to be considered to prevent any release

that may have adverse effects on human health or the environment due to migration of waste constituents in the ground water or subsurface environment. These factors must be addressed to prevent ground-water contamination and the subsurface migration of hazardous waste from miscellaneous units (e.g., geologic repositories and hazardous waste management units that are placed in or on land).

The first factor includes the volume, concentration, and physical and chemical characteristics of the waste placed in the unit. The volume and concentration determine the maximum amount and concentration of waste that may enter the ground water. Physical and chemical characteristics determine (1) the toxicity of the waste; (2) the ability of the waste to be contained, immobilized, degraded, or attenuated or to migrate in various soils and materials; and (3) the probability of undesirable reactions taking place among wastes or between wastes and liners or other containment structures.

The second, third, and fourth factors are the hydrogeologic characteristics of the site and surrounding land, the existing ground-water quality, and the quantity and direction of ground-water flow, respectively. Because these three factors affect the movement of waste constituents in the subsurface environment, they are crucial in assessing the impact on human health and the environment. The hydrogeologic characteristics of the site determine the effect of human activities in the area on the ground water. The third factor focuses on the existing ground-water quality and sources of contamination other than the miscellaneous unit. This factor is relevant for predicting future ground-water uses and the incremental risk of the new unit. The fourth factor assesses the rate and direction of migration and the potential contamination of the site.

The fifth factor is the proximity to and withdrawal rates of current and potential ground-water users. While ground water as a source of drinking water is a primary concern, agricultural and industrial uses of ground water should also be considered. Clearly, water that is contaminated by hazardous waste leachate may present health risks. Information on State ground-water planning and regulatory efforts should also be considered. Also, any changes in ground-water withdrawal rates or patterns can alter the rate of ground-water movement, which influences the rate and direction of migration of contaminants to exposure points. This information is not

only necessary to identify potential impacts to the ground water, but it also can be used in determining monitoring well locations, where necessary.

The sixth factor focuses on land-use patterns. Land-use patterns can change hydrogeologic characteristics and they in turn can alter the rate and direction of potential migration to and distribution of wastes in ground water. This information will be used to identify potential impacts to the ground water.

The seventh factor is movement of waste constituents in the subsurface. This includes migration of waste in gaseous or vapor forms. Subsurface migration of wastes is a type of environmental degradation apart from contamination of ground water. The Love Canal incident provides a classic example of unsaturated zone migration. There, waste constituents migrated from a landfill into the basements of nearby homes. The residents were directly exposed through physical contact with waste and inhalation of volatile contaminants. The potential adverse effects of subsurface migration of waste constituents must be considered in addition to any direct effects on surface water and ground water. The same factors that influence ground-water protection are significant when considering subsurface migration.

Both the saturated and unsaturated zones must be considered in evaluating the potential for subsurface migration. This requires knowledge of the characteristics of the waste in the unit and the hydrogeology of the surrounding area. The patterns of land use in the area, including proximity to residential buildings, are particularly important here.

Also considered in factor seven is the migration of wastes to the soil root zone of food-chain crops and other vegetation. Phytotoxicity may occur as a result, as in the case of heavy metals at high concentrations. Even more important, roots may absorb certain hazardous constituents, which the plant may uptake and pass into the human food chain.

The eighth and ninth factors are the potential adverse impacts that exposure to waste constituents can have on human health and on animal health, plants, and physical structures, respectively. This potential depends on many factors, including the concentration, quantity, toxicity, and transport of the waste constituents.

One commenter agreed that the factors listed in § 264.601 for ground water were necessary to evaluate the adequacy of protection provided by a particular unit. Another commenter

suggested that the rule is unclear on how the need for ground-water monitoring will be evaluated. One other commenter questioned why all units must provide data on hydrogeologic characteristics, land-use patterns, ground-water quality, associated human health effects, and animal and crop exposure assessments. This commenter further suggested that data requirements be tailored to the specific type of unit. Another commenter pointed out that it is not necessary to perform a detailed ground-water and surface water assessment for a facility managing or treating a waste that never comes in contact with the surface of the ground. For example, some open detonation facilities have a synthetically lined detonation range.

In response to the above concerns, the Agency does not necessarily require that all miscellaneous units provide a detailed assessment for each of the nine factors. The standard in § 270.23(b) requires that the factors be considered and evaluated, and assessment data must be presented in the permit application. If the permit applicant's preliminary assessment of these factors indicates that the facility will not impact the factor, and the preliminary assessment of that factor is convincing to the Director, then a detailed assessment is not needed. However, a detailed assessment and associated permit conditions must be developed for those factors found by the preliminary assessment to have the potential for ground-water contamination and migration. The preliminary and detailed assessment procedures are not envisioned as a two-tiered permit process. The preliminary assessment is a tool used by an applicant to avoid the need to conduct a detailed assessment, if the preliminary assessment shows that a detailed assessment is not necessary. The adequacy and findings of the assessments will be considered by the Director as part of the permit review process.

2. Surface Water (Including Wetlands) and Surface Soils

Improper disposal of hazardous wastes can have immediate, far-reaching, and long-term effects on human health or the environment due to migration of waste constituents in surface water or wetlands or on surface soils. Units for which factors related to surface water, wetlands, and surface soils may require particular emphasis are those that are situated on land and are used in an open or semi-enclosed manner. It is, therefore, essential to ensure that these structures are designed and constructed to prevent

surface water, wetlands, and surface soil contamination.

Many of the same factors that influence ground-water protection and minimize risk from subsurface migration of waste constituents are significant for the protection of surface water, wetlands, and surface soils. Therefore, the sections listed in § 264.601(b) are similar to those in § 264.601(a).

The first factor to be evaluated is the volume of the waste in the unit and the waste's physical and chemical characteristics. This factor determines the potential for contamination of surface water, wetlands, and surface soils.

The effectiveness of containment structures should be considered in the second factor because surface waters, wetlands, and surface soils may be contaminated by ground-water migration and by overland flow of waste constituents. Precipitation, run-on, and runoff controls and subsurface structures should be considered, including liners, dikes, diversion ditches, and cut-off walls.

The third, fourth, fifth, and sixth factors require considerations of the hydrogeology and climate of the area. These factors evaluate the area's topography, rainfall patterns, characteristics of ground-water flow, and the proximity of a unit to surface waters. These factors determine the distribution and degree of surface water, wetlands, and surface soil contamination.

The seventh, eighth, and ninth factors evaluate patterns of surface water and land use, existing surface water, wetlands, and surface soil quality, other sources of contamination, and water quality standards. This information is needed to provide insight into the likelihood of health or environmental impacts. Water quality standards provide numerical and narrative criteria tied to particular uses of water bodies. These criteria should guide the Agency, permit applicants, and the public in evaluating the acceptability of managing waste in a particular unit.

In the tenth and eleventh factors, the impacts of waste constituents entering surface waters on human health and on animals, plants, and physical structures must also be analyzed.

One commenter suggested that surface soil for the active portion of open burning/open detonation facilities, as well as soil samples from the primary downwind areas, be monitored and that the monitoring schedule be based on the volume of waste destroyed. The Agency has concluded that establishment of monitoring schedules is more

appropriately defined in the permitting process than in the standards. However, because open burning/open detonation of explosive waste is carried out in pits, trenches, or on the ground surface, or in areas exposed to precipitation, the Agency agrees that it is vital that the factors in this section be adequately addressed so that run-on and runoff are controlled and residual wastes are effectively contained within a well-defined open burning/open detonation area.

3. Air

Some waste management units may present a significant potential for adverse effects on air quality. Section 264.601(c) requires the prevention of any release that may have adverse effects on human health or the environment due to migration of waste constituents in the air, and lists various factors that may be considered in protecting air quality.

The first factor considers the volume and characteristics of the waste in the unit and its potential to react or evaporate to form gaseous, aerosol, or particulate products that enter the atmosphere.

The second factor considers the effectiveness of systems and structures to prevent gaseous, aerosol, or particulate emissions.

The third factor considers the operating parameters of the units that make air emissions likely and create a potential for the production of toxic or explosive gases, aerosols, or particulates.

The fourth and fifth factors take into account the atmospheric, meteorologic, and topographic conditions of the site location, the existing air quality, and the sources of contamination near the site.

The sixth and seventh factors assess the potential adverse impacts on human health and on plants, animals, and physical structures. Of special concern is the inhalation of hazardous constituents by humans exposed to air emissions from these units.

Units for which these air standards have particular importance include open burning/open detonation units and thermal treatment units, such as calcination, pyrolysis, and multi-hearth furnaces. In most cases, air emissions from open burning/open detonation cannot be controlled since it is impossible to operate these units under totally enclosed conditions. Because of this, it is essential that open burning/open detonation (OB/OD) permit applicants consider the volumes and characteristics of the waste, as well as the meteorologic and topographic conditions of the site location. However,

one commenter suggested an alternative technology for controlling air emissions from open burning (not detonation) of explosive wastes. This technology effectively reduces emissions by using an air scrubber. It may, therefore, be an attractive option for some facilities that open burn explosive wastes. In addition, units that thermally treat hazardous wastes can release hazardous air emissions. While permits for these thermal treatment units may incorporate most of the incinerator performance standards under Part 264, these standards may not be sufficient or applicable for Subpart X units, therefore, these units must provide the assessment of air quality factors.

One commenter observed that just as a surface facility must consider and guard against accidental contamination of waters or soils, it must also consider the possibility of contaminated air or gas emissions. Therefore, this commenter suggested that the seven factors included in § 264.601(c) be fully considered. In contrast, commenters expressed concern over the use of the word "any" release, viewing it as too restrictive and not warranted for general applicability to all units. Three commenters noted that air emissions resulting from OB/OD cannot be controlled and, therefore, this technology should be exempt from the requirements of § 264.601(c).

By using the word "any," the Agency does not necessarily mean "no" releases. When a potential exists for a release (e.g., during OB/OD, where air emissions are difficult to control), an assessment must be made of all the factors important in protecting air quality.

There was also concern that if the unit is subject to evaluation and to permitting requirements for stationary sources under the Clean Air Act or under State and local air pollution control standards, such standards should be implemented by these authorities, as they are beyond the Agency's authority under RCRA in those jurisdictions. The Agency does not agree that its RCRA authority does not apply to air emissions. Section 3004(n) clearly requires EPA to control air emissions from hazardous waste facilities. EPA will attempt to minimize any duplication of control by incorporating applicable standards from the Clean Air Act into the RCRA permit. A permit may also include additional necessary conditions imposed under RCRA authorities. For example, current standards under the Clean Air Act may not address all types of hazardous air emissions at treatment, storage, and disposal facilities.

One commenter also objected to the use of "hazardous constituent" in § 264.601. He preferred "hazardous constituent of the waste." The Agency did not change the wording "hazardous constituent" because if the unit is only monitored for hazardous constituents of the waste, then hazardous constituents of possible reaction products will go undetected.

Another commenter suggested that since most State air pollution control regulations prohibit open burning but provide an exemption for explosive waste, the RCRA permitting of open burning should be limited to those exemptions or waivers. The Agency agrees with this commenter and has restricted permitting of OB/OD to explosive wastes.

One commenter indicated that a study is being completed to identify and characterize emissions generated at military OB/OD facilities. This commenter suggested that the Agency consider the data, conclusions, and recommendations from this study in determining the type of monitoring requirements for OB/OD disposal activities. The Agency intends to use this information in developing a permit guidance document on OB/OD.

C. Section 264.602—Monitoring, Analysis, Inspection, Response, Reporting, and Corrective Action

Under § 264.602, each miscellaneous waste management unit must have a monitoring program that includes, where appropriate, a ground-water, surface water, soils, and air quality monitoring system. (Alternatives to ambient air monitoring and analysis may include analysis of waste, emissions measurements, and periodic monitoring with portable detectors.) A monitoring program must include procedures for sampling, analysis, and evaluation of data, suitable response procedures, and a regular inspection schedule. This requirement is intended to ensure that the permit specifies all monitoring, inspection, and response activities and the frequency with which these activities are to be conducted. Including these specifications in the permit will require monitoring by the owner or operator to prevent violation of permit requirements and to prevent damage. It will also enable the oversight agency, through inspections and enforcement, to assess whether the unit is in compliance with the permit and, therefore, with the requirements of § 264.601.

Since each miscellaneous unit covered by this section may be distinctive in its design, operation, and location, the Agency is leaving the specifications as well as the extent of the monitoring,

inspection, and response program to the evaluation of the permitting official. At a minimum, the monitoring program for a miscellaneous unit should be capable of determining the unit's impacts on ground water in the uppermost aquifer, surface water, air quality, and the extent of surface and subsurface contaminant migration, to ensure compliance with § 264.601.

The program should consider the following: (1) The depth and location of monitoring wells or other sampling devices necessary to obtain representative samples of constituents in various media; (2) the constituents to be monitored and the frequency of monitoring; (3) procedures to maintain the integrity of monitoring devices; (4) sample collection and preservation procedures; (5) analytical methods used for sampling and analysis; (6) applicable procedures for the evaluation of data from the monitoring program; and (7) appropriate response procedures for cases where the monitoring program indicates that the unit is not in compliance with § 264.601.

The monitoring, inspection, and response program under a Subpart X permit will include requirements linking inspections and monitoring of the unit to the appropriate response. The Agency will incorporate the Part 264 Subpart F standards for ground-water monitoring, protection, and corrective action for establishing a ground-water monitoring program at appropriate Subpart X units.

The owner or operator of each miscellaneous waste management unit covered by this section must comply with the biennial reporting requirements specified under § 264.75. These requirements are the same as those in effect for all hazardous waste treatment, storage, and disposal facilities that are specifically regulated under Part 264.

Under RCRA authority contained in sections 3004 (u) and (v), the Agency is developing standards for corrective action at facilities seeking a RCRA permit. EPA has already codified the general obligation to perform corrective action for release from Solid Waste Management Units (SWMUs) at hazardous waste facilities (see 40 CFR 264.101). In the interim, EPA will make a decision on appropriate corrective actions for SWMUs on a case-by-case basis in individual permit proceedings. These standards, scheduled to be proposed in late 1987, will be applicable to hazardous waste management units including Subpart X units to the extent that they can be applied without resulting in highly hazardous situations or adverse cross-media contamination and are technically feasible. Until these

new standards are finalized, the corrective action requirements in 264.101 apply to Subpart X.

One commenter suggested that the regulations relating to ground-water and surface water monitoring are necessary but should be clarified. The commenter further noted that for some operations (e.g., OB/OD) only some of the factors need to be addressed. Additionally, this commenter suggested that the scope of the requirements should be clarified when a more extensive analysis is indicated. In this commenter's opinion, the requirement in § 270.23(b) is overly broad and the information necessary for detailed assessments often will not be available. Thus, these assessments may be prohibitively expensive if the requirement is broadly interpreted. Another commenter was concerned that the Agency is leaving the specifications, as well as the extent of the monitoring, inspection, and response requirements, to the evaluation of the permitting official.

The Agency agrees to some extent with these commenters. If the Agency provides a comprehensive list of permit requirements, it will be easier for both permit applicants and permit writers in addressing the informational requirements. However, because of the diversity of the types of miscellaneous units, it is impossible to identify specific information requirements for individual units. Where applicable, the Agency prefers that a permit applicant provide (a) detailed plans and engineering reports; (b) hydrologic, geologic, atmospheric, and meteorologic assessments; (c) information on the potential pathways of exposure of humans or environmental receptors and the extent of exposure; and (d) closure and post-closure procedures. In addition, because the nature of each unit can vary a great deal, any steps taken to meet the requirements of the Subpart X environmental performance standards must also be furnished.

One commenter was concerned that the Subpart F standards for ground-water monitoring are not mandated, carte blanche, but are used where appropriate. He noted that in some sections it is clearly stated that miscellaneous units need not comply with Subpart F requirements, and that conversely, in other sections of the rules, the Agency implies that the permit applicant must comply with Subpart F where ground-water monitoring is deemed necessary. This commenter suggested that these inconsistencies should be clarified to require permit applicants to establish a ground-water monitoring program where it is

necessary to protect human health and the environment. The Agency agrees and requires compliance with Subpart F ground-water monitoring requirements on a case-by-case determination when necessary to protect human health and the environment.

The monitoring, analysis, inspection, response, and reporting requirements described in this rule are designed to be generic with the establishment of unit-specific requirements during the permitting process. By providing specifics for OB/OD units and geologic repositories in permit guidance to be developed, the Agency will identify unit-specific monitoring and analysis needs.

D. Section 264.603—Post-Closure Care

In addition to complying with the appropriate post-closure standards of Subpart G of Part 264 during the post-closure care period, owners and operators of miscellaneous units permitted under Subpart X that dispose of hazardous wastes must continue to meet the environmental performance standards of § 264.601 that applied in the operating period. This requirement is included to ensure that units used for disposal are maintained properly after closure. It is also applicable to treatment or storage units that cannot completely remove or decontaminate soils or ground water at closure.

Maintaining the unit during this period must be based upon procedures that are specified in a written post-closure plan, as required in § 264.118. Where appropriate, the post-closure plan must include monitoring, response, and maintenance procedures.

In response to post-closure requirements, one commenter recommended that the miscellaneous unit concept also be incorporated into Part 265. He stated that this would allow for the use of innovative technologies during closure of facilities with interim status. He also stated that often materials present at sites regulated under Part 265 must be treated as part of the closure activity and that preparation of a RCRA Part B permit application for new activities at a facility can take up to two years. He argued that some regulatory mechanism should be available for the amendment of a RCRA Part A permit to allow for new activities related to the closure of a site. Unless the miscellaneous unit concept is expanded to Part 265 and an expeditious procedure is developed to amend Part A permits, new technologies for treating hazardous waste will be largely unavailable to facilities closing under interim status.

The Agency recognizes the commenter's concern related to

innovative technologies developed under interim status. This commenter is attempting to close a facility using an innovative technology. If the commenter is developing a new technology to treat hazardous waste at the facility being closed, or if he is demonstrating the application of a newly developed technology to treat hazardous waste, then this commenter may be able to use a research, development, and demonstration permit under § 270.65, assuming that he meets all of the requirements of that section. The purpose of RD&D permits is to allow for testing and demonstration of innovative and experimental technologies, including the modification of existing technologies, if the technology is experimental or innovative and there are no permit standards for the activity. Cleanup of facilities may occur, incident to testing and demonstration, under an RD&D permit. If the activity does not qualify for an RD&D permit, then the facility owner or operator must apply for a Subpart X permit.

The commenter stated that guidance on what is meant by removing all "contamination," as well as other "how clean is clean" issues, would be useful in closing Subpart X units. The Agency agrees and is preparing a "clean closure" guidance for release in the fall of 1987 that will provide useful information on one option for closure of land-based units.

Another commenter suggested that Subpart X should address closure of miscellaneous units in a fashion similar to that set forth in subparts relating to tanks, landfills, waste piles, etc. Specifically, § 264.110 should be amended to reference Subpart X. A new section in Subpart X should address closure and post-closure in language similar to the analogous sections in Subparts I through O.

The Agency disagrees with this commenter. Because of the unique characteristics of the miscellaneous units, the specific requirements given in Subparts I through O for closure and post-closure are not necessarily appropriate. Therefore, under § 264.603, these units must continue to comply with the appropriate post-closure standards of Subpart G of Part 264 and the environmental performance standards of § 264.601 during the post-closure care period. However, for a unit that resembles, by definition, one of the units in Subparts I through O, those standards may provide a starting point in developing closure and post-closure requirements for the miscellaneous unit.

In one commenter's opinion, requiring post-closure care if a facility cannot

"remove all contaminated soils or ground water" at closure is unduly restrictive and should be limited to toxic and hazardous constituents remaining at the facility after closure at a level determined to be a threat to human health and the environment. In response to this comment, the Agency, under a separate action, is developing a clean closure guidance. In addition, the Agency in the preamble to the March 19, 1987, Part II, Federal Register sets forth the RCRA standards for "clean closure."

VI. Amendments to Part 270: Permit Requirements

A. General Permit Requirements

Application and review requirements for permitting hazardous waste management facilities under RCRA are contained in Part 270. All owners and operators of units that treat, store, or dispose of hazardous waste in miscellaneous units must obtain permits under Part 270 regulations. Subpart X applicants must comply with the general application requirements, including Part A permit requirements, Part B general application requirements of § 270.10, and Part B specific information requirements. Part 270 regulations specify what information owners and operators of facilities must submit in their permit applications to demonstrate compliance with the Part 264 standards (both the general standards in Subparts A through F, G and H, F when required, and the specific standards in Subpart X). The general information requirements in Part 270 apply to all owners and operators of miscellaneous units.

Most of the comments specific to the permit requirements indicated a need for (1) standardization and acceleration of the permitting process; (2) minimization of the need for individual permits by providing an industry-specific variance, a class permit, or a special permit; and (3) an individual analysis of the applicability of permits and regulations prior to the permitting process. Some commenters were concerned that permit writers will be too autonomous, and that too much specialization will be required to issue Subpart X permits effectively. This could complicate the permitting process by causing both a shortage of qualified permit writers and increased costs to industry, as well as creating an inconsistency in the implementation of the permit standards by the writers.

The Agency has attempted to alleviate to some degree the commenters' concerns over the diverse permit requirements in today's rule by providing a standard, generic permit requirement for miscellaneous units. This standard permit requirement

incorporates Part 264's individual compliance standards required under Subparts A through H, as well as the specific standards in Subpart X. In the Agency's opinion, technical support from the Permit Assistance Teams, any technology-specific permit guidance, and the availability of detailed technology descriptions, engineering reports, and information on monitoring, operational features, as well as maintenance, inspection, analysis, and closure procedures contained in the permit application should provide the permit writer with sufficient information to effectively develop permits on the miscellaneous units.

One commenter suggested that the Agency should incorporate standards developed by other agencies, such as the Department of Defense (DOD), Department of Energy (DOE), and the Nuclear Regulatory Commission (NRC). Another commenter requested that a generic permit application form for Subpart X units be developed. Other commenters preferred a specific exemption for *de minimis* quantities of waste processed by certain units operated by the explosives industry. Under RCRA, Small Quantity Generators (SQGs) are provided exemption from the permitting requirement in § 261. However, none of the treatment and disposal standards contained in Part 264 provide exemption from the permitting requirements for managing *de minimis* quantities and the Agency has no authority to, nor does it see any reason to exempt *de minimis* quantities.

The Agency regards these comments as very constructive and has incorporated portions of them in the development of today's rule. For example, in cooperation with the Department of the Army, the Agency is developing a permit guidance for OB/OD. The Agency also intends to review DOE's and NRC's permitting standards developed for the disposal of nuclear wastes in salt domes and deactivated missile silos. In the Agency's opinion, existing Part B permit application forms used for all other subparts of Part 264 are sufficient and provide adequate detail. Hence, no specific permit application form for Subpart X units is warranted. Although the Agency is not providing specific Subpart X permit applications, it is identifying the specific information requirements in the following section.

Another commenter suggested that the Agency should concentrate on establishing an information system capable of informing permit writers of miscellaneous units and providing up-to-

date information on what units have been permitted in various States and EPA regions. In his judgment, this would shorten the time spent "reinventing the wheel." The Agency welcomes this suggestion and wants to point out that the Hazardous Waste Data Management System (HWDMS) data base, even though not seen as a perfect information dissemination tool, does serve the purpose of data transfer among the States, EPA regions, and EPA Headquarters.

The HWDMS data base can be accessed through the National Computer Center (NCC), Research Triangle Park, North Carolina, by the Headquarters, Regional, and State EPA officials or their approved contractors. This data base provides hazardous waste generators and management facility-specific information related to Parts A and B permit status. For each type of hazardous waste facility, detailed information is coded. The information includes Standard Industrial Codes (SIC); the facility's name and address, the permit status; the quantities and types of wastes generated and managed, the types of treatment, storage, and disposal methods and their capacities; and financial and ownership status. The data base is updated and revised frequently.

Currently, such a status-reporting mechanism is used by the Agency for tracking research, development, and demonstration (RD&D) permits. Similarly, the Agency may provide the status of various Subpart X permits to Permit Assistance Teams (PAT) staff and permit writers. The intent of the Subpart X units' status reports is to provide current information, such as (a) the types of units for which permit applications are submitted, (b) the unit's permit status, and (c) a brief description of the unit. This will allow various permit writers and PAT staff in different regions to permit similar units consistently and efficiently.

B. Specific Information Requirements for Miscellaneous Units In § 270.23

The specific information requirements for miscellaneous units included in § 270.23 are intended to clarify and define the type of unit that is being permitted. The applicant must describe the unit, its physical characteristics, materials of construction, and dimensions. The bulk of the application is expected to contain detailed plans and engineering reports describing how the unit will be located, designed, constructed, operated, maintained, monitored, inspected, and closed to comply with the requirements of

§§ 264.601 and 264.602. The plan should include a detailed process description.

In developing the application, each of the environmental performance standards must be assessed. Where this assessment indicates that releases to air, surface water, or ground water are possible, the applicant is expected to provide detailed hydrologic, geologic, and meteorologic assessments and maps for the region surrounding the site. Applications for disposal units must contain a description of the plans to comply with the post-closure requirements of § 264.603.

The permit application must contain information (a) on the potential pathways of exposure to humans or environmental receptors of hazardous waste or hazardous constituents and (b) on the potential magnitude and nature of such exposures. In addition, for each treatment unit, any reports on demonstrations of the effectiveness of similar treatment based on laboratory, bench-scale, pilot-scale, or field data gathered under an RD&D permit should be submitted.

If the unit to be permitted involves an innovative or experimental waste treatment process or technology where insufficient data are available to assess its effectiveness, if it is to be demonstrated over a short period of time, and if the technology will be conducted in a unit that meets the RD&D criteria, an RD&D permit may be necessary. For additional information on RD&D permits, refer to § 270.65 and EPA Publication No. EPA/530-SW-86-008, "Guidance Manual for Research, Development, and Demonstration Permits Under 40 CFR Section 270.65." If the demonstration is to be long term (i.e., may eventually be used as a commercial-scale treatment process) or does not meet the RD&D criteria, a permit may be obtained under Subpart X. Under certain circumstances, an RD&D permit may be necessary to gather additional data that may be required to fulfill Subpart X permit-related risk assessment needs. To gather such data the owner/operator can use the RD&D permit as a vehicle to demonstrate the effectiveness of a technology.

If a multi-stage demonstration project is to be permitted under Subpart X, two possible permitting options are available. First, a single permit that covers the entire demonstration could be written. As revisions are needed to a permit to reflect the outcome of individual stages, permit modifications could be requested under 40 CFR 270.41 and 270.42, provided the reason for requesting a modification meets one of the criteria for modification in these

subparts. Alternatively, where the outcome of one stage may radically change the subsequent stages, a permit could be obtained for this first stage. At its completion, a permit could be issued for the subsequent stages. Each permit would terminate with the completion of a stage, and a new permit would be issued for the succeeding stage, based upon an evaluation of the results of the concluded stage. The exact permitting strategy to be used would be determined by the permit writer, based upon the type of treatment process and the demonstration.

Under § 270.23, a detailed description of the unit will be required specific to the development of a unit's design, construction, location, operation, maintenance, inspection, and closure so that it meets the requirements of the environmental performance standards.

One commenter was concerned over the information requirements on potential pathways of exposure of humans or environmental receptors to hazardous wastes or constituents. He suggested that knowledge of the potential magnitude and nature of such requirements for every miscellaneous unit to be permitted under Subpart X standards may be unnecessary in certain cases. In his opinion, development of such extensive data for fate and transport studies would be cost-prohibitive and time-consuming. He further suggested that a petition process could be instituted to demonstrate on a case-by-case basis an exemption from such an information requirement.

As mentioned previously, a detailed risk assessment is not necessary. However, at a minimum, the applicant must identify the potential impacts of hazardous constituents in different media. If the preliminary assessment conducted by the permit applicant indicates that releases to each of the media are possible, the permit applicant must further evaluate whether releases will occur and demonstrate ways to minimize the potential releases. This allows the permit writer to develop specific monitoring, analysis, and reporting guidelines for each particular unit.

C. Conforming Changes

Conforming changes are in other sections of Part 270 to accommodate the new Subpart X regulations. The Agency is not proposing to make changes to the Part 124 permit processing procedures. Issuance of permits for miscellaneous units would be subject to Part 124 in the same manner as other hazardous waste permits.

VII. Applicability to State Hazardous Waste Management Programs

A. Applicability of Rules in Authorized States

Under section 3006 of RCRA, the Agency may authorize qualified States to administer and enforce the RCRA program within the State. (See 40 CFR Part 271 for the standards and requirements for authorization.) Following authorization, the Agency retains enforcement authority under sections 3008, 7003, and 3013 of RCRA, although authorized States have primary enforcement responsibility.

Prior to the Hazardous and Solid Waste Amendments of 1984 (HSWA), a State with final authorization administered its own hazardous waste program, rather than the Agency administering the federal program in that State. The Federal requirements no longer applied in the authorized State, and the Agency could not issue permits for any facilities that the State was authorized to permit. When new, more stringent Federal requirements were promulgated or enacted, the State was obliged to enact equivalent authority within specified time frames. New Federal requirements did not take effect in an authorized State until the State adopted the requirements as State law.

In contrast, under section 3006(g) of RCRA, 42 U.S.C. 6927, new requirements and prohibitions imposed by HSWA take effect in authorized States at the same time that they take effect in nonauthorized States. The Agency is directed to carry out those requirements and prohibitions in authorized States, including the issuance of permits, until the State is granted authorization to do so. While States must still adopt HSWA-related provisions as State law to retain final authorization, HSWA applies in authorized States in the interim.

B. Effect on State Authorizations

Today's announcement promulgates standards that are not effective in authorized States because the requirements are not being imposed pursuant to HSWA. Thus, the requirements will be applicable only in those States that do not have interim or final authorization. In authorized States, the requirements will not be applicable until the State revises its program to adopt equivalent requirements under State law.

Under 40 CFR 271.21(e)(2), States that have final authorization must modify their programs to reflect equivalent requirements and by July 1, 1989, must submit the modifications to the Agency

for approval. This deadline can be extended in certain cases (40 CFR 271.21(e)(3)). Once the Agency approves the modification, the State requirements become Subtitle C RCRA requirements.

States with authorized RCRA programs may already have requirements similar to those in today's rule. These State regulations have not been assessed against the federal regulations being promulgated today to determine whether they meet the tests for authorization. Thus, a State is not authorized to carry out requirements in lieu of the Agency until the State program modification is submitted to the Agency and approved. Of course, States with existing standards may continue to administer and enforce their standards as a matter of State law.

States that submit their official applications for final authorization less than 12 months after the effective date of these standards are not required to include equivalent standards in their applications. However, they must modify their programs by the deadlines set forth in § 271.21(e). States that submit official applications for final authorization 12 months after the effective date of these standards must include standards equivalent to these standards in their applications. The requirements a State must meet when submitting its final authorization application are set forth in 40 CFR 271.3.

The Agency is precluded from issuing permits to new units in States authorized to implement RCRA in lieu of the Agency. However, 40 CFR 264.1(f)(2) provides an exception: the Agency may issue permits in authorized States if the unit was not regulated under RCRA at the time of the State's authorization and its standards for permitting the unit were promulgated after the State received final authorization. Thus, according to this provision, the Agency may issue a permit to a new facility under Subpart X in an authorized State. The Agency's permitting authority would cease, however, once the State modified its program, in accordance with § 271.21(e), to reflect the Federal Subpart X standards.

VIII. Effective Dates

Today's rule is effective 30 days from date of publication (in compliance with section 553(d) of the Administrative Procedures Act). EPA believes that it has a sound basis for suspending the statutory six-month effective date (RCRA Section 3010(b)) for this regulatory amendment. Section 3010(b) provides that EPA may shorten the effective date for good cause found and published with the regulation. The Agency believes that there is good cause

to suspend this six-month period because of the demand by the regulated community to apply for and obtain Subpart X permits. Currently, persons are prohibited from building new Subpart X facilities or expanding existing interim status facilities that will be covered under Subpart X. By shortening the effective date of today's rule to 30 days, the Agency enables such persons to obtain the necessary permits expeditiously. Since such permits are not required to be obtained within the six-month period, shortening the effective date will not burden the regulated community.

IX. Regulatory Analyses

A. Regulatory Impact Analysis

Under Executive Order No. 12291, the Agency must judge whether a regulation is "major" and thus subject to the requirement of a Regulatory Impact Analysis. The notice published today is not major because the rule will not result in an effect on the economy of \$100 million or more, will not result in increased costs or prices, will not have significant adverse effects on competition, employment, investment, productivity, and innovation, and will not significantly disrupt domestic or export markets. Therefore, the Agency has not prepared a Regulatory Impact Analysis under the Executive Order.

This regulation was submitted to the Office of Management and Budget for review as required by Executive Order No. 12291.

B. Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) requires each Federal agency to consider the effects of their regulations on small entities and to examine alternatives that may reduce these effects. With respect to today's rule, there is no means of anticipating exactly how many miscellaneous units, if any, will be owned and operated by small entities. In general, the Agency believes that the large amounts of capital required and the technical complexity necessary to establish safe and secure miscellaneous units will mean that larger entities will predominate. Therefore, the Agency certifies that this regulation will not have a significant impact on a substantial number of small entities.

C. Paperwork Reduction Act

The information collection requirements contained in this rule have been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et*

seq. have been assigned OMB control number 2050-0074.

X. Supporting Documents

In preparing the final rule, the Agency has used the following major sources of information. They have been placed in the rulemaking docket at U.S. Environmental Protection Agency, EPA RCRA Docket (sub-basement), 401 M Street, SW, Washington, DC 20460. The docket is open from 9:00 a.m. to 4:00 p.m., Monday through Friday, except for Federal holidays. The public must make an appointment to review docket materials by calling (202) 475-9327.

The major sources are 1. Public Comments on the November 7, 1986, proposal to regulate miscellaneous units. All the public comments received on the proposal are included in the docket at EPA Headquarters. These comments were considered by EPA in developing today's final rule.

2. Background Document: Subpart X Comments and Responses, Versar Inc. (November 1987). This document provides the Agency's response to specific comments to the proposal.

List of Subjects

40 CFR Part 144

Administrative practice and procedure, Hazardous materials, Waste treatment and disposal.

40 CFR Part 260

Administrative practice and procedures, Confidential business information, Hazardous materials, Waste treatment and disposal.

40 CFR Part 264

Hazardous material, Packaging and containers, Reporting requirements, Security measures, Surety bonds, Waste treatment and disposal.

40 CFR Part 270

Administrative practice and procedures, Reporting and recordkeeping requirements, Hazardous materials, Waste treatment and disposal, Water pollution control, Water supply, Confidential business information.

Date: November 25, 1987

Lee M. Thomas,
Administrator.

For the reasons set out in the preamble, Parts 144, 260, 264, and 270 of Chapter I of Title 40 of the Code of Federal Regulations are amended as follows.

PART 144—UNDERGROUND INJECTION CONTROL PROGRAM

The authority citation for Part 144 continues to read as follows:

Authority: Pub. L. 93-523, as amended by Pub. L. 95-190, Pub. L. 96-63, Pub. L. 96-502, and Pub. L. 99-339, 42 U.S.C. 300f et seq.

2. Section 144.31(a) is amended by adding the following sentence at the end of the paragraph to read as follows:

§ 144.31 Application for a permit; authorization by permit.

(a) * * * A RCRA permit applying the standards of Part 264 Subpart X will constitute a UIC permit for hazardous waste injection wells for which the technical standards in Part 146 are not generally appropriate.

PART 260—HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERAL

3. The authority citation for Part 260 is revised to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921 through 6927, 6930, 6934, 6935, 6937, 6938, 6939, and 6974.

4. Section 260.10 is amended by adding the definition "Miscellaneous Unit" in alphabetical order and revising the definition "Landfill" to read as follows:

• • • • •
.10 Definitions.
 • • • • •

"Landfill" means a disposal facility or part of a facility where hazardous waste is placed in or on land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, or a cave.

"Miscellaneous unit" means a hazardous waste management unit where hazardous waste is treated, stored, or disposed of and that is not a container, tank, surface impoundment, pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, underground injection well with appropriate technical standards under 40 CFR Part 146, or unit eligible for a research, development, and demonstration permit under § 270.65.

PART 264—STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

5. The authority citation for Part 264 is added to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6924, and 6925

6. Section 264.10 is amended by revising paragraph (b) to read as follows:

• • • • •
§ 264.10 Applicability.
 • • • • •

(b) Section 264.18(b) applies only to facilities subject to regulation under Subparts I through O and Subpart X of this part.

7. Section 264.15 is amended by revising the last sentence of paragraph (b)(4) to read as follows:

• • • • •
§ 264.15 General inspection requirements.
 • • • • •

(b) * * *
 (4) * * * At a minimum, the inspection schedule must include the terms and frequencies called for in §§ 264.174, 264.194, 264.228, 264.253, 264.254, 264.303, 264.347, and 264.602, where applicable.

8. Section 264.18 is amended by revising the introductory text of paragraph (b)(1)(ii) to read as follows:

• • • • •
§ 264.18 Location standards.
 • • • • •

(b) * * *
 (1) * * *
 (ii) For existing surface impoundments, waste piles, land treatment units, landfills, and miscellaneous units, no adverse effects on human health or the environment will result if washout occurs, considering:

9. Section 264.73 is amended by revising paragraph (b)(6) to read as follows:

• • • • •
§ 264.73 Operating record.
 • • • • •

(b) * * *
 (6) Monitoring, testing or analytical data, and corrective action where required by Subpart F and §§ 264.226, 264.253, 264.254, 264.276, 264.278, 264.280, 264.303, 264.309, 264.347, and 264.602;

10. Section 264.90 is amended by adding a new paragraph (d) to read as follows:

• • • • •
§ 264.90 Applicability.
 • • • • •

(d) Regulations in this subpart may apply to miscellaneous units when necessary to comply with §§ 264.601 through 264.603.

11. Section 264.111 is amended by revising paragraph (c) to read as follows:

• • • • •
§ 264.111 Closure performance standard.
 • • • • •

(c) Complies with the closure requirements of this subpart, including, but not limited to, the requirements of §§ 264.178, 264.197, 264.228, 264.258, 264.280, 264.310, 264.351, and 264.601 through 264.603.

12. Section 264.112 is amended by revising paragraph (a)(2) to read as follows:

• • • • •
§ 264.112 Closure plan; amendment of plan.
 • • • • •

(a) * * *
 (2) The Director's approval of the plan must ensure that the approved closure plan is consistent with §§ 264.111 through 264.115 and the applicable requirements of §§ 264.90 et seq., 264.178, 264.197, 264.228, 264.258, 264.280, 264.310, 264.351, and 264.601. Until final closure is completed and certified in accordance with § 264.115, a copy of the approved plan and all approved revisions must be furnished to the Director upon request, including request by mail.

13. Section 264.114 is amended by revising the first sentence to read as follows:

• • • • •
§ 264.114 Disposal or decontamination of equipment, structures, and soils.
 • • • • •

During the partial and final closure periods, all contaminated equipment, structures, and soils must be properly disposed of or decontaminated, unless otherwise specified in §§ 264.226, 264.258, 264.280, or 264.310, or under the authority of § 264.601 and § 264.603.

14. Section 264.117 is amended by revising paragraphs (a)(1)(i) and (a)(1)(ii) to read as follows:

• • • • •
§ 264.117 Post-closure care and use of property.
 • • • • •

(a) (1) * * *
 (i) Monitoring and reporting in accordance with the requirements of Subparts F, K, L, M, N, and X of this part; and

(ii) Maintenance and monitoring of waste containment systems in accordance with the requirements of Subparts F, K, L, M, N, and X of this part.

15. Section 264.118 is amended by revising paragraphs (b)(1) and (b)(2)(i) and (b)(2)(ii) to read as follows:

• • • • •
§ 264.118 Post-closure plan; amendment of plan.
 • • • • •

(b) . . .

(1) A description of the planned monitoring activities and frequencies at which they will be performed to comply with Subparts F, K, L, M, N, and X of this part during the post-closure care period; and

(2) . . .

(i) The integrity of the cap and final cover or other containment systems in accordance with the requirements of Subparts F, K, L, M, N, and X of this part; and

(ii) The function of the monitoring equipment in accordance with the requirements of Subparts F, K, L, M, N, and X of this part; and

16. Section 264.142 is amended by revising the introductory text of paragraph (a) to read as follows:

§ 264.142 Cost estimate for closure.

(a) The owner or operator must have a detailed written estimate, in current dollars, of the cost of closing the facility in accordance with the requirements in §§ 264.111 through 264.115 and applicable closure requirements in §§ 264.178, 264.197, 264.228, 264.258, 264.280, 264.310, 264.351, and 264.601 through 264.603.

17. Section 264.144 is amended by revising the introductory text of paragraph (a) to read as follows:

§ 264.144 Cost estimate for post-closure care.

(a) The owner or operator of a disposal surface impoundment, disposal miscellaneous unit, land treatment unit, or landfill unit, or of a surface impoundment or waste pile required under §§ 264.228 and 264.258 to prepare a contingent closure and post-closure plan, must have a detailed written estimate, in current dollars, of the annual cost of post-closure monitoring and maintenance of the facility in accordance with the applicable post-closure regulations in §§ 264.117 through 264.120, 264.228, 264.258, 264.280, 264.310, and 264.603.

Section 264.147 is amended by revising the first sentence of paragraph (b) introductory text to read as follows:

§ 264.147 Liability requirements.

(b) *Coverage for nonsudden accidental occurrences.* An owner or operator of a surface impoundment, landfill, land treatment facility, or miscellaneous disposal unit that is used to manage hazardous waste, or a group of such facilities, must demonstrate financial responsibility for bodily injury

and property damage to third parties caused by nonsudden accidental occurrences arising from operations of the facility or group of facilities. . . .

19. Part 264 is amended by adding Subpart X consisting of §§ 264.600 through 264.999 to read as follows:

Subpart X—Miscellaneous Units

Sec

264.600 Applicability.

264.601 Environmental performance standards.

264.602 Monitoring, analysis, inspection, response, reporting, and corrective action

264.603 Post-closure care.

264.604 through 264.999 [Reserved]

Subpart X—Miscellaneous Units

§ 264.600 Applicability.

The requirements in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous waste in miscellaneous units, except as § 264.1 provide otherwise.

§ 264.601 Environmental performance standards.

A miscellaneous unit must be located, designed, constructed, operated, maintained, and closed in a manner that will ensure protection of human health and the environment. Permits for miscellaneous units are to contain such terms and provisions as necessary to protect human health and the environment, including, but not limited to, as appropriate, design and operating requirements, detection and monitoring requirements, and requirements for responses to releases of hazardous waste or hazardous constituents from the unit. Permit terms and provisions shall include those requirements of Subparts I through O of this part, Part 270, and Part 146 that are appropriate for the miscellaneous unit being permitted. Protection of human health and the environment includes, but is not limited to:

(a) Prevention of any releases that may have adverse effects on human health or the environment due to migration of waste constituents in the ground water or subsurface environment, considering:

(1) The volume and physical and chemical characteristics of the waste in the unit, including its potential for migration through soil, liners, or other containing structures;

(2) The hydrologic and geologic characteristics of the unit and the surrounding area;

(3) The existing quality of ground water, including other sources of

contamination and their cumulative impact on the ground water;

(4) The quantity and direction of ground-water flow;

(5) The proximity to and withdrawal rates of current and potential ground-water users;

(6) The patterns of land use in the region;

(7) The potential for deposition or migration of waste constituents into subsurface physical structures, and into the root zone of food-chain crops and other vegetation;

(8) The potential for health risks caused by human exposure to waste constituents; and

(9) The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;

(b) Prevention of any releases that may have adverse effects on human health or the environment due to migration of waste constituents in surface water, or wetlands or on the soil surface considering:

(1) The volume and physical and chemical characteristics of the waste in the unit;

(2) The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing migration;

(3) The hydrologic characteristics of the unit and the surrounding area, including the topography of the land around the unit;

(4) The patterns of precipitation in the region;

(5) The quantity, quality, and direction of ground-water flow;

(6) The proximity of the unit to surface waters;

(7) The current and potential uses of nearby surface waters and any water quality standards established for those surface waters;

(8) The existing quality of surface waters and surface soils, including other sources of contamination and their cumulative impact on surface waters and surface soils;

(9) The patterns of land use in the region;

(10) The potential for health risks caused by human exposure to waste constituents; and

(11) The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

(c) Prevention of any release that may have adverse effects on human health or the environment due to migration of

waste constituents in the air, considering:

(1) The volume and physical and chemical characteristics of the waste in the unit, including its potential for the emission and dispersal of gases, aerosols and particulates;

(2) The effectiveness and reliability of systems and structures to reduce or prevent emissions of hazardous constituents to the air;

(3) The operating characteristics of the unit;

(4) The atmospheric, meteorologic, and topographic characteristics of the unit and the surrounding area;

(5) The existing quality of the air, including other sources of contamination and their cumulative impact on the air;

(6) The potential for health risks caused by human exposure to waste constituents; and

(7) The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

§ 264.602 Monitoring, analysis, inspection, response, reporting, and corrective action.

Monitoring, testing, analytical data, inspections, response, and reporting procedures and frequencies must ensure compliance with §§ 264.601, 264.15, 33, 264.75, 264.76, 264.77, and 264.101 as well as meet any additional requirements needed to protect human health and the environment as specified in the permit.

§ 264.603. Post-closure care.

A miscellaneous unit that is a disposal unit must be maintained in a manner that complies with § 264.601 during the post-closure care period. In addition, if a treatment or storage unit has contaminated soils or ground water that cannot be completely removed or decontaminated during closure, then that unit must also meet the requirements of § 264.601 during post-closure care. The post-closure plan under § 264.118 must specify the

procedures that will be used to satisfy this requirement

§§ 264.604 through 264.999 (Reserved)

PART 270—EPA ADMINISTERED PERMIT PROGRAMS: THE HAZARDOUS WASTE PERMIT PROGRAM

20. The authority citation for Part 270 is revised to read as follows:

Authority: 42 U.S.C. 6905, 6912, 6925, 6927, 6939, and 6974.

21. Section 270.14 is amended by revising paragraphs (b)(5) and (b)(13) to read as follows:

§ 270.14 Contents of Part B: General requirements.

• • • • •

(b) • • •

(5) A copy of the general inspection schedule required by § 264.15(b). Include, where applicable, as part of the inspection schedule, specific requirements in §§ 264.174, 264.194, 264.228, 264.254, 264.273, 264.303, and 264.602.

• • • • •

(13) A copy of the closure plan and, where applicable, the post-closure plan required by §§ 264.112 and 264.118. Include, where applicable, as part of the plans, specific requirements in §§ 264.178, 264.197, 264.228, 264.258, 264.280, 264.310, 264.351, 264.601, and 264.603.

• • • • •

22. Part 270 is amended by adding a new § 270.23 to Subpart B to read as follows:

§ 270.23 Specific Part B information requirements for miscellaneous units.

Except as otherwise provided in § 264.600, owners and operators of facilities that treat, store, or dispose of hazardous waste in miscellaneous units must provide the following additional information:

(a) A detailed description of the unit being used or proposed for use, including the following.

(1) Physical characteristics, materials of construction, and dimensions of the unit;

(2) Detailed plans and engineering reports describing how the unit will be located, designed, constructed, operated, maintained, monitored, inspected, and closed to comply with the requirements of §§ 264.601 and 264.602; and

(3) For disposal units, a detailed description of the plans to comply with the post-closure requirements of § 264.603.

(b) Detailed hydrologic, geologic, and meteorologic assessments and land-use maps for the region surrounding the site that address and ensure compliance of the unit with each factor in the environmental performance standards of § 264.601. If the applicant can demonstrate that he does not violate the environmental performance standards of § 264.601 and the Director agrees with such demonstration, preliminary hydrologic, geologic, and meteorologic assessments will suffice.

(c) Information on the potential pathways of exposure of humans or environmental receptors to hazardous waste or hazardous constituents and on the potential magnitude and nature of such exposures.

(d) For any treatment unit, a report on a demonstration of the effectiveness of the treatment based on laboratory or field data.

(e) Any additional information determined by the Director to be necessary for evaluation of compliance of the unit with the environmental performance standards of § 264.601.

(The information requirements in this section have been approved by the Office of Management and Budget and assigned OMB Control Number 2050-0074.)

§§ 270.24 through 270.29 (Reserved).

[FR Doc. 87-27997 Filed 12-9-87, 8:45 am]

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APPENDIX D

EVALUATION OF ENVIRONMENTAL PERFORMANCE STANDARDS

I. Introduction

A. Regulations

The Environmental Protection Agency (EPA) has recently revised 40 CFR Section 264 and Section 270 of the Resource Conservation and Recovery Act (RCRA) to include guidelines for miscellaneous units including facilities which treat hazardous substances through open burning and/or open detonation (OB/OD). In those guidelines EPA has specified environmental performance standards for groundwater, surface water, including wetlands and surface soils, and air. These media must be considered as part of the permit application process. These media may require a preliminary assessment, detailed assessment, monitoring program and/or a corrective action program. These will be discussed below as they relate to the environmental performance standards established in 40 CFR Section 264.601.

B. Assessments

The purpose of the preliminary assessment is to determine if the treatment of hazardous materials at the OB/OD facility will violate any of the performance standards established to protect groundwater, surface water, and air. The preliminary assessment is intended to be a tool used by a permit applicant to avoid the need to conduct a detailed assessment. As described in 40 CFR Section 270.23(b), if the applicant can demonstrate that he does not violate the environmental performance standards of 40 CFR Section 264.601 and the Director agrees with such a demonstration, preliminary hydrologic, geologic, and meteorologic assessments will suffice and a detailed assessment may not be required.

If, based on information obtained through the preliminary assessment, it is determined that treatment of hazardous materials will violate any of the performance standards of 40 CFR Section 264.601, a detailed assessment of those environmental performance standards must be conducted.

The intent of the detailed assessment is to provide specific detailed assessments of the hydrology, geology, meteorology and any other applicable parameters of the site. In addition, land use maps for the region surrounding the site that address and ensure compliance of the unit with each factor in the environmental performance standards of 40 CFR Section 264.601 must be provided as required per 40 CFR Section 270.23(b).

C. Monitoring

The Director will use information submitted in the detailed assessment to establish a monitoring schedule for a given facility which will continue throughout the active life of the facility. As required under 40 CFR Section 264.602, each miscellaneous waste management unit must have a monitoring program that includes where applicable a groundwater, surface water, soils, and air quality monitoring program. A monitoring program must include procedures for sampling, analysis, evaluation of data, suitable response procedures, and a regular inspection schedule.

At a minimum, the monitoring program shall consider the following; (1) the depth and location of monitoring wells or other sampling devices necessary to obtain representative samples of constituents in various media; (2) the constituents to be monitored and the frequency of monitoring; (3) procedures to maintain the integrity of the monitoring devices; (4) sample collection and preservation procedures; (5) analytical methods used for sampling and analysis; (6) applicable procedures for the evaluation of data from the monitoring program; and (7) appropriate response procedures for cases where the monitoring program indicates that the unit is not in compliance with the environmental performance standards of 40 CFR Section 264.601. A description of the environmental performance standards is provided in Section II of this report.

II. The OB/OD facility shall be operated in a manner that prevents any release that may have adverse effects on human health or the environment due to migration of waste constituents in the groundwater or subsurface environment, including:

A. The volume and physical and chemical characteristics of the waste in the unit, including its potential for migration through soil, liners, or other containing structures.

Before an owner or operator treats, stores, or disposes of any hazardous waste, he must obtain a detailed chemical and physical analysis of a representative sample of the waste. At a minimum, this analysis must contain all the information which must be known to treat, store, or dispose of the waste in accordance with the requirements of 40 CFR Sections 264 and 270.

The waste analysis plan must include (1) the parameters for which each hazardous waste will be analyzed and the rationale for the selection of these parameters; (2) the test methods that will be used for these parameters; (3) the sampling method which will be used to obtain a representative sample of the waste to be analyzed; (4) the frequency with which the initial analysis of the waste will be reviewed or repeated to ensure that the analysis is accurate and up to date and the waste analysis plan must be revised whenever the characteristics of the waste handled at the facility changes. In addition, the permit applicant must demonstrate the potential for the hazardous materials to migrate through the soil, liners, or other containing structure as applicable.

The intent of such an analysis is to determine the toxicity, ability of the waste to be contained, immobilized, degraded, attenuated or ability to migrate or be dispersed in the groundwater, surface water, soil or air. The data should be generated from representative sampling procedures where possible. If, however, the hazardous materials are reactive such that sampling poses an excessive danger to human health, it may be conducive to obtain data from feedstock chemicals used in the production of the ordnances and/or other hazardous materials.

B. The hydrologic and geologic characteristics of the unit and the surrounding area.

The preliminary assessment may involve an investigation of the hydrologic, and geologic, characteristics of the unit and surrounding area. If the applicant can demonstrate that the characteristics of the waste, based on the waste analysis plan, do not pose a significant threat to human health and the environment and the Director of EPA agrees, the applicant may only be required to conduct preliminary assessments on these parameters.

Parameters that may be investigated in the preliminary assessment may include the following; whether the groundwater is used as a source of drinking or irrigation water, the depth to groundwater, estimated annual recharge, topography, and the aquifer and soil media. EPA may use this information along with other preliminary information to determine if a detailed assessment is warranted.

Based on the waste analysis plan and the information submitted in the preliminary assessment, the Director may determine that there is a significant threat of contamination to the groundwater and subsurface soil. If such a determination is made, the permit applicant will be required to conduct a detailed assessment of the hydrology and geology at the site.

As part of the detailed assessment, a thorough investigation of the site hydrogeology, and geology should be conducted to substantiate the need and/or feasibility of a future groundwater monitoring program. In most cases, this information will have to be obtained through field investigations or existing well log data.

Based on the information in the preliminary and detailed assessment, a groundwater monitoring program may be required by EPA. The groundwater monitoring program will identify (1) a list of indicator parameters, waste constituents, or reaction products that can provide a reliable indication of the presence of hazardous constituents in the groundwater; (2) a proposed groundwater monitoring program that indicates the number

and location of groundwater monitoring wells both up and down gradient; (3) background values for each proposed monitoring parameter or constituent, or procedures to calculate such values; (4) a description of proposed sampling, analysis and statistical comparison procedures to be utilized in evaluating groundwater monitoring data and any other parameters the Director deems necessary to protect human health and the environment.

C. The existing quality of groundwater, including other sources of contamination and their cumulative impact on the groundwater

As part of the detailed assessment, the existing quality of the groundwater shall be established. Information regarding the quality of the groundwater may be substantiated through well-log data obtained from a current monitoring program. If there is no groundwater monitoring program in place, the permit applicant may be required to establish a detection monitoring program to determine background values for each proposed monitoring parameter or constituent. In addition, the permit applicant shall determine any other sources of contamination, including concentrations, and their cumulative impact on the groundwater where applicable.

The permit applicant may also be required to submit any other information the Director deems necessary to fully characterize the hydrology and geology of the site as required per 40 CFR Section 270.14 and 264 Subpart F. Some of these parameters may only be determined through direct measurement techniques.

D. The quantity and direction of groundwater flow.

As part of the detailed assessment, the quantity and direction of the groundwater shall be determined. In determining the quantity and direction of flow, the permit applicant may be required to also determine (1) where the uppermost aquifer begins; (2) any aquifers hydraulically interconnected; (3) the pore water velocity and the hydraulic conductivity of the aquifer. These parameters can only be investigated through direct measurement techniques.

E. The proximity to and withdrawal rates of current and potential groundwater users.

The preliminary assessment should determine if there are any potential groundwater users in the area of the OB/OD facility. If it is determined that there are no other users of the groundwater in the vicinity of the facility, the permit applicant may not be required to submit further information on this issue. If, however, it is determined that there are other users of the groundwater in the vicinity of the facility, the permit applicant will be required to conduct a detailed assessment.

The detailed assessment may include a discussion of the current and potential users of the groundwater supply. The permit applicant may be required to indicate the location of such users on a topographic map of the facility and surrounding area. In addition, the withdrawal rates of current and potential users should be documented.

F. Patterns of land use in the region.

The permit applicant is required to submit a description of the regional land uses which could have an impact on the surrounding topography or geology and thus affect the hydrogeology of the area. Some issues that may require investigation are nearby landfills, major construction projects, major excavations, extensive paving, and/or surface water diversions or damming near an OB/OD unit may change some of the hydrogeologic characteristics of the site.

G. The potential for deposition or migration of waste constituents into subsurface physical structures, and into the root zone of food-chain crops and other vegetation.

The hydrologic and geologic information submitted in the detailed assessment of Section I.B-D should indicate the potential for subsurface migration. Additional information may include, but is not limited to, a determination of the soil bulk density, volumetric water content, pore water velocity, and the effective porosity of the soil. Of particular interest to EPA is the

potential for contaminants to migrate to the soil root zone of food chain crops and other vegetation. In such cases, phytotoxicity may result through the uptake of heavy metals or other hazardous materials.

H. The potential for health risks caused by human exposure to waste constituents.

The primary concern is whether the aquifer is a source of drinking water. If this is true, the permit applicant may be required to conduct a detailed assessment on the potential for human exposure to the waste constituents via contaminated groundwater.

A great deal of the pertinent information regarding this issue may have already been substantiated in Sections IB-D. However, a summary of the health risk information pertaining to each of the parameters identified in the waste analysis plan should also be provided. For metal compounds, this information is well documented; however, for explosive materials, health risk information may be limited. Available sources of information may be obtained from EPA or other sources of information may be used if the data are based on sound technical investigation techniques. All sources of information must be referenced.

I. The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

If the preliminary assessment indicates that domestic animals, wildlife, crops, vegetation, and/or physical structures may be damaged through exposure to the waste constituents, a detailed assessment may need to be performed.

The detailed assessment should include the toxicological assessments for the wastes identified in the waste analysis plan. Data may be obtained from EPA or other sources if the data are based on sound technical investigation techniques. All sources of information must be referenced.

III. Prevention of any releases that may have adverse effects on human health or the environment due to migration of waste constituents in surface water, or wetlands or on the soil surface considering:

- A. The volume and physical and chemical characteristics of the waste in the unit.**

These requirements are the same as in Section II.A.

- B. The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing migration.**

The preliminary assessment may include a discussion of the need and/or feasibility of containment structures. In some instances, especially open detonation, it may not be technically feasible to install containment devices. In such cases, the permit applicant should provide facility specific information and supporting evidence for such a claim.

In the event that EPA requires a detailed assessment of the facilities containment devices, the following parameters should be considered. The permit applicant should provide engineering data on containment structures such as run-on and run-off control devices, and subsurface structures such as liners, dikes, diversion ditches, and cutoff walls as applicable. Since open burning/open detonation is carried out in pits, trenches, or on the ground surface, or in areas exposed to precipitation. EPA has determined that the factors in this section shall be adequately addressed so that run-on and run-off are controlled and residual wastes are contained within a well defined open burning/open detonation area.

- C. The hydrologic characteristics of the unit and the surrounding area, including the topography of the land around the unit.**

The requirements for the preliminary and detailed assessment of the hydrology at a given OB/OD are the same as in Section II.B-D.

A preliminary assessment of the topography at the OB/OD facility may require a description of the site from previously documented data. However, as part of the detailed assessment, the Director may require that topographic maps be provided that clearly delineate the topography of the area which may determine the ultimate migration path(s) of any released hazardous materials or residues.

D. Patterns of precipitation in the region.

The preliminary assessment may involve consulting published meteorological data to determine if precipitation will act as a potential source of contaminant migration. If precipitation is not expected to contribute to contaminant migration, for example in an arid climate, the information should be submitted and substantiated through referenced materials.

If the Director determines that precipitation may lead to contaminant migration, a detailed assessment may be required. The detailed assessment may require the owner/operator to establish the volume of precipitation in the area and discuss how run-on or run-off will be minimized. In addition, the owner/operator may be required to submit information regarding how the accumulated precipitation will be removed from the OB/OD area and the methods of containment and treatment.

E. The quantity, quality, and direction of groundwater flow.

These requirements are the same as in Section II.C and D.

F. The proximity of the unit to surface water

The preliminary assessment may involve a description of the proximity of the OB/OD facility to surface waters. If the facility is not located near any surface water sources, no further investigation is warranted. In such cases, the permit applicant may be required to submit a topographic map illustrating this situation.

If the facility is located near surface water, a detailed assessment may be required. The Director may require that the specific location of the OB/OD facility be shown on a topographic map at a scale of 1 inch equal to not more than 200 feet. In addition, the owner/operator may be required to demonstrate that the facility is not located in a 100 year floodplain. If the facility is located in a 100 year floodplain, the permit applicant must submit engineering analysis to indicate the various hydrodynamic and hydrostatic forces expected to result at the site as consequence of a 100 year flood.

The permit applicant must also submit structural or other engineering studies showing the design of operational units at the facility and how these will prevent washout. If applicable, and in lieu of the above mentioned precautionary measures, the permit applicant may submit a detailed description of the procedures to be followed to remove the waste from the site. The timing of such movement relative to flood levels, including estimated time to move the waste, to show that such movement can be completed before floodwaters reach the facility and a description of the locations to where the waste will be moved must be provided. In addition, all applicable standards of 40 CFR Section 270.14(11)(iii) must be complied with.

- G. The current and potential uses of nearby surface waters and any water quality standards established for those surface waters.**

The permit applicant will be required to make an assessment of the current and potential uses of nearby surface waters such as industrial, recreational, aesthetic value or any others that may apply. In addition the permit applicant will be required to identify any applicable water quality standards that exist such as those established in the Clean Water or Safe Drinking Water Act.

- H. The existing quality of surface waters and surface soils, including other sources of contamination and their cumulative impacts on surface waters and surface soils.**

For facilities that are to be located in areas where past hazardous waste management practices are known not to have existed, the preliminary assessment may involve

a determination of the existing surface water and soil quality by consulting previously published or historical data. However, this information may require supportive data generated through soil and water sampling and analysis. If the results indicate that hazardous materials have been handled at the proposed site a detailed assessment will be required.

The detailed assessment may require the installation of groundwater monitoring wells or lysimeters to determine the existing quality of the soil. In addition, procedures for soil sampling and analysis may need to be established along with a quality assurance plan. All sampling and analysis should be performed according to EPA protocol. The cumulative impacts from past hazardous materials practice will also have to be evaluated. Based on the information submitted in the detailed assessment, the Director may require soil sampling and monitoring on a periodic basis throughout the active life of the facility.

The detailed assessment will also require an analysis of the surface water quality. This may require the development of procedures for water sampling and analysis along with a quality assurance plan. All sampling and analysis should be performed according to EPA protocol. Based on the information submitted in the detailed assessment, the Director may water sampling and monitoring throughout the active life of the facility. The Director may also establish other parameters that will need to be considered in assessing the surface soil and water quality.

I. Patterns of land use in the region.

These requirements are the same as in Section II.F

J. The potential for health risks caused by human exposure to waste constituents.

These requirements are the same as in Section II.H

K. The potential for damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

These requirements are the same as in Section II.I

IV. Prevention of any release that may have adverse effects on human health or the environment due to migration of waste constituents in the air.

The operation of some waste treatment units may present a significant potential for adverse effects on air quality. The requirements for the prevention of any release that may have adverse effects on human health or the environment due to migration of waste constituents in the air are discussed in 40 CFR 264.601(c). That subsection also lists various factors that may need to be considered in the preliminary assessment.

In most cases, controlling emissions from open burning/open detonation facilities has been difficult due to the means of treatment. However, regulations may be implemented that will limit the quantities of materials to be treated so as to ensure combustion of the waste to the greatest extent possible. In addition, EPA has determined that Section 3004 (n) of RCRA specifically requires them to control air emissions from hazardous waste facilities. Monitoring may be implemented for OB/OD facilities in the form of portable monitors or other technically feasible methods which will determine the concentration of emissions.

A. The volume and physical and chemical characteristics of the waste in the unit, including its potential for the emission of hazardous constituents to the air.

The requirements for the waste analysis plan are described in Section II.A. The plan should also include a detailed description of the potential for the emission of hazardous constituents to the air. It should include a discussion of the potential for the waste to react or evaporate

B. The effectiveness and reliability of systems and structures to reduce or prevent emissions of hazardous constituents to air.

In the preliminary assessment the owner/operator may be required to submit information on the effectiveness and reliability of the systems and structures to prevent air emissions where applicable. In cases, such as OB/OD facilities where the burning or detonation of hazardous materials is conducted under uncontrolled conditions, the conditions which prohibit the use of containment systems and structures should be provided.

The Director may require the owner/operator to conduct a comprehensive detailed assessment on the facility. Some areas of concern which may be included in the detailed assessment include (1) detailed engineering descriptions of any emission control devices (2) supportive calculations and analysis which conclude that the quantities burned or detonated do not pose a significant threat to human health or the environment; (3) operating procedures; (4) quality assurance and/or safety plans and (5) quantities of waste burned or detonated on a daily or annual basis. The owner/operator should provide enough detailed information to convince the Director that the waste is being treated in a manner that is safe and protective of the environment.

C. Operating characteristics of the unit

The Director may require a detailed analysis of operating characteristics of the OB/OD unit to be conducted. Parameters that may need to be discussed include (1) a complete physical and chemical description of the waste; (2) a copy of the waste analysis plan; (3) security procedures and equipment; (4) inspection schedule; (5) contingency plan; (6) general hazard prevention; (7) precautions to prevent accidental ignition or reaction of ignitable, reactive, or incompatible wastes; (8) training programs; (9) procedures to prevent ash dispersal in the event of high winds and any other information relating to the safe operation of the facility and protection of human health and the environment.

D. The atmospheric, meteorologic, and topographic characteristics of the unit and the surrounding area.

A preliminary assessment may be conducted to determine the atmospheric, meteorologic, and topographic parameters that may influence the transport of hazardous constituents in the air. In this case, a certified meteorologist and/or geologist may be able to provide sufficient preliminary information about the site without further investigation.

In the event that further investigation is warranted, a detailed assessment may be required which will constitute field investigations along with previously published or historical data regarding the proposed

treatment site. Certain meteorological, atmospheric, and topographical conditions can facilitate or hinder the dilution and dispersion of any released toxic substances in the atmosphere. A thorough evaluation of these three parameters should be conducted to ensure that operations are only conducted at times and in places that will be conducive to the dispersion and dilution of any toxic releases.

E. The existing quality of the air, including other sources of contamination and their cumulative impact on the air.

The preliminary assessment will involve determining if there are other sources of toxic or potentially toxic releases to the atmosphere in the area. If it is determined that there are no other such sources of emissions in the area, the permit applicant should substantiate this determination and a detailed assessment may not be required. If, on the other hand, other sources of atmospheric releases are determined to be significant, a detailed assessment of the air quality in the area and their cumulative impact on the air quality may be required.

The detailed assessment should investigate all available sources of air quality in and around the facility. This investigation should address air quality in terms of toxic pollutants rather than the criteria pollutants. If no background database is available, the permit applicant may be required to generate the necessary background information through field investigation. In some instances, and in lieu of the expense involved in establishing background values, it may be appropriate to generate approximate background data through modeling procedures.

F. The potential for health risks caused by human exposure to waste constituents.

These requirements have been addressed in Subpart H of Section I.

G. The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

These requirements have been addressed in Subpart I of Section I.

APPENDIX E



ACQUISITION AND
LOGISTICS

THE OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D. C. 20301-4000

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APR 15 1986

MEMORANDUM FOR DEPUTY FOR ENVIRONMENT, SAFETY AND OCCUPATIONAL
HEALTH, OASA (I&L)
DEPUTY DIRECTOR FOR ENVIRONMENT, OASN (S&L)
DEPUTY FOR ENVIRONMENT, SAFETY AND OCCUPATIONAL
HEALTH, (SAF/MIQ)
DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Applicability of Resource Conservation and Recovery Act
(RCRA) Hazardous Waste Regulations to Demilitarization
of Conventional Military Munitions

Military munitions are not a hazardous waste until they are discarded or until there is an intent to dispose or destroy them. They are not wastes when recycled in lieu of disposal. RCRA hazardous waste requirements apply to the demilitarization process if the method of demilitarization is to destruct the item by open burning, open detonation, incineration or other treatment unrelated to use, reuse, reclamation or sale.

The assignment of intent to dispose or destroy a military munition defines the point at which RCRA applies. This is normally when the Ammunition Transfer Record (DD Form 1348-1, DA Form 4508, or equivalent) is signed by the last approval authority acknowledging receipt of the munition at a demilitarization facility (i.e., open burning grounds, open detonation area, incinerator, or other treatment unit).

Assignment of items to the Special Defense Property Disposal Account (SDPDA) does not by itself constitute a designation of such items as waste, solid waste or hazardous waste. The items are ammunition, explosive, and other dangerous articles, serviceable and unserviceable, awaiting final decision of use, reuse, reclamation, sales or demilitarization.

There could be instances when military munitions in storage are declared a waste prior to demilitarization. Military services will provide justification for this declaration to DoD (OASD(A&L)SS) for approval before hand. Once such a decision is made then the items will be managed in conformance with RCRA requirements and in strict accordance with existing DoD regulations.

RCRA hazardous waste requirements apply to the resultant products generated by a demilitarization process. Any remaining residue, ash, sludge, etc., is considered hazardous waste, and must be handled in accordance with applicable hazardous waste regulations.

DoD is the recognized national expert for matters relating to the safe handling and disposition of military munitions and ordnance (including propellants, explosives and pyrotechnics - PTP). DoD regulations governing transportation, storage, inspections, safety, and security, for handling of military munitions are very stringent, and provide adequate protection for human health and environment. Strict adherence to these procedures is mandatory.

Should a regulatory agency nonetheless require a RCRA permit, DoD will adhere to that requirement; however the substance of the permit should be to require adherence with existing DoD requirements. Any additional administrative or operational requirements under RCRA could be an unnecessary administrative burden, cause operational cost without any increase in safety or protection to human health and the environment, and could detract from the military mission of DoD.

This guidance will be issued as a DoD instruction as soon as possible.



Carl J. Schafer, Jr.
Director, Environmental Policy

cc: DAEN-ZCE
NOP-45
HQM (LFL)
AF/LEEV
DLA-W



DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, DC 20350-2000

IN REPLY REFER TO
5090
Ser 451/5U393676
25 Apr 85

From: Chief of Naval Operations

Subj: APPLICABILITY OF RESOURCE CONSERVATION AND RECOVERY ACT
(RCRA) HAZARDOUS WASTE REGULATIONS TO MILITARY MUNITIONS

Encl: (1) Dir Env Policy DASD(I) memo of 18 March 1985

1. The Office of the Secretary of Defense had been involved in continuing discussion and meetings with Environmental Protection Agency representatives to clarify the subject area as it pertains to the Special Defense Property Disposal Account (SDPDA). The resulting "interim guidance" provided as enclosure (1) is designed to enable your activities to determine when SDPDA items are, and are not subject to RCRA regulations.
2. It should be noted that the demolition of munitions by Explosive Ordnance Disposal (EOD) units for emergency action, or training is not subject to RCRA regulation. This guidance includes the clearing of ranges and eventual destruction of recovered items by EOD teams.
3. It is requested that addressees disseminate enclosure (1) and the guidance herein to your appropriate activities.


J. B. GREEN (Jr.)
By direction

Distribution:

A2A (Department of the Navy Staff Offices)(CNR only)
A4A (CHNAVMAT)
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Subj: APPLICABILITY OF RESOURCE CONSERVATION AND RECOVERY ACT
(RCRA) HAZARDOUS WASTE REGULATIONS TO MILITARY MUNITIONS

Copy to:

A6 (CMC)
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MANPOWER
INSTALLATIONS
AND LOGISTICS

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, DC 20301-4000

18 MAR 1985

MEMORANDUM FOR DEPUTY FOR ENVIRONMENT, SAFETY AND OCCUPATIONAL
HEALTH, OASA (I&L)
DIRECTOR FOR INSTALLATIONS AND FACILITIES,
OASN (S&L)
DEPUTY FOR ENVIRONMENT AND SAFETY (SAF/MIQ)
DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Applicability of RCRA Hazardous Waste Regulations to
Military Munitions

This memorandum provides interim guidance effective until July 5, 1985, unless superseded by then, on the applicability of Resource Conservation and Recovery Act (RCRA) hazardous waste regulations to military munitions assigned to the Special Defense Property Disposal Account (SDPDA), also known as the LLP Account.

Assignment of items to the SDPDA does not by itself constitute a designation of such items as waste, solid waste or hazardous waste. The items are ammunition, explosive, and other dangerous articles, serviceable and unserviceable, awaiting final decision of use, reuse, reclamation, sales, or demilitarization.

Military munitions are not considered a waste until demilitarization occurs, a final decision has been made by proper authority to discard the item, the item is damaged and cannot be fired, or the item is no longer useful as a munition to the United States or to any potential buyer. Once such a case occurs then further management of that item becomes subject to RCRA as outlined below. Any such material will be stored, treated and disposed in accordance with RCRA requirements.

RCRA hazardous waste requirements apply to demilitarization facilities under the following conditions:

RCRA hazardous waste requirements apply if the method of demilitarization is to destruct the item by open burning, open detonation, incineration or other treatment unrelated to use, reuse, reclamation or sale.

RCRA hazardous waste requirements apply to the hazardous waste generated by a demilitarization process; i.e., any remaining residue, ash, sludge, etc., is considered hazardous waste since it is the result of processing energetic material, unless it can be demonstrated that such residue is not a listed RCRA hazardous waste or does not exhibit the characteristics of hazardous waste.

Conversely, RCRA hazardous waste requirements do not apply to a demilitarization process if the method involves removal or conversion of contained explosives or other materials in a manner that such products are retained for further use, reuse, reclamation, or sales.

DoD is the recognized national expert for matters relating to the safe handling and disposition of military munitions and ordnance (to include propellants, explosives and pyrotechnics-PEP). DoD management procedures and practices governing transportation, storage, inspections, safety, and security, for handling of military munitions are very strict and are considered to provide adequate protection for human health and environment. Strict adherence to these DoD procedures is mandatory.

Once a final decision has been made to destroy or discard a military munition, and no use, reuse, reclamation or sale is logical, then a storage permit may be required to conform with RCRA regulations. It may also be necessary to separately account for such items and to store them in an identifiably separate location, not necessarily a different structure, from the serviceable inventory.

Should a permit be required the provisions should reflect existing procedures and practices required by DoD directives or regulations. The substance of the permit should be to require, under force of law (RCRA), adherence with existing DoD requirements. Any additional administrative or operational requirements under RCRA may be an unnecessary administrative burden or operational cost without any increase in safety or protection to human health or the environment, and could detract from the military mission of DoD. This position has been informally discussed with EPA and negotiations are underway.

This interim guidance will be issued as DoD policy when these negotiations are completed with EPA. Copies of Services implementation of the interim guidance should be forwarded to OASD(MI&L)I/EP within 15 days of dissemination.



Carl J. Schafer, Jr.
Director, Environmental Policy

cc: DAEN-ZCE
NOP-45✓
HQMC (LFL)
AF/LEEV
DLA-W



THE OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON D C 20301-8000

ACQUISITION AND
LOGISTICS

MAY 30 1986

MEMORANDUM FOR DEPUTY FOR ENVIRONMENT, SAFETY AND OCCUPATIONAL
HEALTH, OASA (I&L)
DEPUTY DIRECTOR FOR ENVIRONMENT, OASN (S&L)
DEPUTY FOR ENVIRONMENT, SAFETY, AND OCCUPATIONAL
HEALTH, (SAF/MIQ)
DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Definition of Hazardous Waste

This memorandum is issued to clarify the definition of hazardous waste applicable to DoD. The definition of hazardous material is outside the scope of this memorandum.

Hazardous waste is any material that is a solid waste as defined under the Resource Conservation and Recovery Act (RCRA), and has also been classified as hazardous in conformity with the provisions of RCRA. RCRA assigns the Environmental Protection Agency (EPA) the authority to define hazardous waste. EPA criteria for hazardous waste classification are specified in 40 CFR 261. DoD will use these criteria to decide whether to deal with a solid waste as hazardous. EPA approved State hazardous waste programs may identify additional solid wastes to be dealt with as hazardous. DoD will comply with those State designations.

Where State and local requirements other than those which are part of an EPA approved program call for management of waste as though it were hazardous, DoD policy is to comply to the extent feasible. Where requirements appear to discriminate against DoD or are applied in a discriminatory manner, affected DoD Units will advise their environmental and legal support staffs to seek a resolution. A negotiated understanding with the involved regulatory body is preferred.

Enclosure (1) elaborates on the EPA definition of hazardous waste. Most cases of hazardous waste determination will fall within the criteria in enclosure (1). Addressees should make wide distribution of this policy statement.


John H. Schaefer, Jr.
John H. Schaefer, Jr.
Director, Environmental Policy

Enclosure

page 2. Coordination

SUBJECT: Definition of Hazardous Waste

OASA (I&L)


OASD (S&L), Director, Installations
and Facilities, 15 May 1986

(SAF/MIO)

DLA

FEDERAL CRITERIA FOR HAZARDOUS WASTE

GENERAL PRECAUTIONS

1. REGULATIONS VARY

Following is a condensed version of the federal definition of hazardous waste as it generally affects DoD.
STATE DEFINITIONS COULD APPLY INSTEAD OF THE FEDERAL.

2. KNOW WHAT YOU HAVE

Although no generic definition of hazardous waste exists, a given material in a specific situation can be determined to be hazardous waste with reasonable ease, often with only a paper search or telephone call.

3. CALL YOUR ENVIRONMENTAL STAFF

The easiest way to determine if you have hazardous waste is to identify the composition and condition of your material and ask your environmental support staff if it is hazardous waste. Questions on federal criteria can be addressed to EPA's RCRA "Hotline" at 800-424-9346; however, always check with your environmental protection staff before applying a Hotline answer.

HIGHLIGHTS OF FEDERAL CRITERIA

4. SIGNIFICANCE OF BEING SOLID WASTE

All solid waste is subject to regulation. If the solid waste is also hazardous, it is subject to hazardous waste regulation. Some solid waste, like used oil, is subject to strict regulation even if it does not exactly meet criteria for being hazardous.

5. EXCESS MATERIAL WHICH IS NOT SOLID WASTE

a. To have Hazardous Waste you must first have Solid Waste. Generally speaking, if an excess material can be used for its originally intended purpose, a downgraded but essentially the same purpose or as a direct substitute (without reprocessing) for a commercial product or raw material, it is NOT solid waste. Therefore, even if it's hazardous material, it is NOT hazardous waste. Examples are:

(1) Unused excess hazardous material, or hazardous material which has exceeded its military shelf-life but can be recertified, such as paint, or hazardous material which has exceeded military shelf-life but not commercial self-life, such as shipboard water treatment chemical;

(2) Contaminated solvent from electronics parts cleaning which is subsequently used for degreasing auto parts, so long as no re-distillation has occurred;

(3) A mixture of JP-4 and JP-5, no longer fit for aircraft use, being used as a stationary boiler fuel or fuel supplement, so long as mixing with a non-fuel petroleum, such as used solvent, has not occurred;

(4) A secondary material such as acid from batteries which is used to lower pH in an industrial waste treatment plant or is being held under the assumption that it will be used instead of buying new acid. However if this kind of material is stored, 75% must be recycled in a year or else the stored material is considered to be solid waste. If, as in the case of battery acid, the material is also hazardous, it is then considered to be regulated hazardous waste.

b. Except as noted, the above types of materials are not solid waste and therefore not hazardous waste. They should not be subjected, without justification, to generation, storage, transportation or marketing regulation as hazardous waste.

6. EXCESS MATERIAL WHICH IS SOLID WASTE

a. Anything, used or unused, opened or unopened, contaminated or not, that is committed to landfilling, incineration or treatment.

b. Recycling alone does NOT exempt a material from being a solid waste. It also depends on how it is recycled. The following are examples of materials which are solid waste even though they are being recycled.

(1) Anything recycled by burning as a fuel (except fuel itself).

(2) Anything recycled by land application (except things like fertilizer that are intended to be put on the ground).

(3) Spent solvent being re-distilled.

(4) Used oil being re-refined

7. DETERMINING IF SOLID WASTE IS HAZARDOUS WASTE

There are two ways to determine if solid waste is hazardous waste.

a. The easy way is to see if it's listed in 40 CFR 261.30-33. Items on this federal list include every commonly used solvent EXCEPT Stoddard (PD680), for example: methylene chloride, MEK, trichloroethane, toluene, xylene, and cresols. Also included are pesticide residues and plating wastes and the sludges from their treatment.

b. The other way is more complicated. A solid waste is also hazardous if it "exhibits a characteristic" of being hazardous. There are four of these characteristics: ignitability, corrosivity, reactivity and "EP" toxicity. Each requires a special test to determine as described at 40 CFR 261.21 through 24. The test doesn't have to be performed each time. Usually once is enough, and from then on you know your residue is hazardous. Often (but not always) you can tell from label information on the raw material that becomes waste. However, be careful: EPA "ignitable" is not the same as DOT "flammable;" EPA "corrosivity" is not the same as DOT "corrosive;" EPA reactivity is not the same as DOT "explosive;" and EPA "EP Toxicity" is not the same as OSHA toxicity.

8. HAZARDOUS WASTE IS REGULATED AS SOON AS IT'S GENERATED

a. There is no grace period after generation in which hazardous waste can be considered unregulated material. At the generation point, up to one 55 gallon drum of most hazardous waste that DoD deals with can be accumulated if it's put in a compatible container in good condition that's kept closed except to put waste in and labeled as hazardous waste. As soon as that drum is full, it must be stored in a facility that meets special criteria and is operated in a designated way. If the hazardous waste is accumulated in a tank, the tank must meet storage criteria. SEE 40 CFR 262.34.

b. There is no 90 day period of exemption from storage criteria. If storage in a facility that meets standards is over 90 days, that facility must ALSO have a permit. Anyone storing hazardous waste will do so in a facility that meets federal or federally approved state standards regardless of whether it needs a permit.

9. MIXING HAZARDOUS AND NON-HAZARDOUS WASTE

a. Hazardous waste which is hazardous solely because it "exhibits a characteristic" (See 7.b.) may be rendered non-hazardous by blending it with other material to the point where the resultant mixture no longer exhibits the characteristic.

b. If "listed" hazardous waste (7.a.) is mixed with non-hazardous waste or "characteristic" waste, the mixture is hazardous waste and may not be diluted to non-hazardous status. For example, what seems like a productive consolidation of a small amount of a solvent like trichloroethane with a tank of clean used motor oil makes the whole tank hazardous waste. Furthermore, even if the motor oil had been hazardous because of high lead picked up during use, the used oil could have been blended to reduce the lead concentration (a "characteristic") making it essentially unregulated. However, blending to reduce the concentration of solvent is not allowed and the mixture must be handled as hazardous waste.

10. EMPTY CONTAINERS

a. Empty containers that held hazardous material or hazardous waste are not regulated, but empty is specifically defined.

(1) Containers that held material or waste with EPA waste numbers F-020 through F-027 listed in 40 CFR 261.31 and all waste listed in 40 CFR 261.33(e) are not empty until triple rinsed with a solvent (40 CFR 261.7(b)(3)) (the solvent is of course then hazardous waste).

(2) Containers that held other hazardous material or waste are empty when 1 inch or less of liquid remains or 3% by weight of capacity if less than 110 gallon size or 0.3% by weight if over 110 gallon size.

b. If more than the allowed residue remains, the containers must be handled as hazardous waste even if recycled as metal or sent to a drum reconditioner. If the drums are returned to a manufacturer who will reuse the residue in his process or refill the drums with the same material, they do not have to be handled as hazardous waste.

c. Even though containers are properly managed by DoD, they pose a source of liability because of unlawful use after they leave DoD control. Anyone disposing of drums must take action to assure that liability does not accrue to DoD because of identifying markings on the drums should the drums be reused by other than DoD units to hold hazardous waste.

WHERE TO GET HELP

11. CHECK WITH YOUR ENVIRONMENTAL STAFF

There are many possible variations and exceptions. For example, used oil, whether listed or not as a hazardous waste, will be regulated; and evolving small quantity generator standards may apply or may be excluded by State criteria. Remember, a regulatory agency is not required to tell you if you have a hazardous waste. You are required to tell them. If you have any questions, call your environmental staff.

APPENDIX F

CHARACTERISTIC FLORA AND FAUNA OF THE DEMOLITION KEY AREA

I. INTRODUCTION

In order for Demolition Key to be properly permitted to Open Burn/Open Detonate PEP (Pyrotechnics, Explosives, and Propellants), above ground and underwater, it will be necessary to address environmental impact issues concerning several characteristic flora and fauna of the lower Florida Keys.

Wildlife in the Florida Keys is highly protected and many of its waterways fall under the Florida Water Quality Standards, F.A.C. 17-3.041 Special Protection, Outstanding Florida Waters. Two such areas in the proximity of Demolition Key are the Key West National Wildlife Refuge and the Great White Heron National Wildlife Refuge. These protected areas are home to many varieties of birds, fish, and plant species. The flora and fauna addressed in this feasibility study are contained in two categories: those plants or animals which are known to be present on Demolition Key, and those which could possibly be affected by future OB/OD operations at Demolition Key. Characteristic flora of Demolition Key include: Australian pines, Bay cedars, Mangroves, and Sea grasses. At the present there are believed to be no characteristic fauna making a permanent home on Demolition Key itself, however this feasibility study will carefully address the possibility of protected or endangered species being impacted by OB/OD operations. Three such fauna are Rose corals, Manatees, and the Least Tern.

II. CHARACTERISTIC FLORA

Several characteristic flora which should be addressed in relation to Open Burning/Open Detonation operations were observed during the site visit to Demolition Key. The majority of growth in the interior of the island consists of 15'-20' Australian pines and smaller Bay Cedars. In order to eliminate any fire hazards from the Open Burning/Open Detonation of munitions and explosives on Demolition Key, the Navy plans to clear all existing Australian pines from the

interior of the island. This procedure will entail obtaining a permit from the local agricultural office to burn the trees after they are cut. Australian pines are not native to the Florida Keys and are considered an invasive nuisance. The pine has a very shallow root system which makes it susceptible to high winds. This factor renders it unsuitable for transplantation as a shade tree or for other commercial landscaping purposes. It also has very brittle branches which makes it unattractive for nesting birds. Several Bay cedars which dot the interior of the island are protected by Monroe County and will be removed and transplanted elsewhere for landscaping purposes.

The perimeter of the key is encompassed by a line of mangroves. In compliance with F.A.C. 17-27 Mangrove Protection, no mangroves will be cut, removed, defoliated or otherwise destroyed by any means. This protection stems from the mangroves vital role in estuarine nutrition, providing nurseries for many species of fish, and saving valuable shoreline by buffering wave action. Although Open Burning/Open Detonation above land has been discontinued for approximately two years, mangroves have thrived on Demolition Key during the peak of EOD activities and no adverse effects have been observed during OB/OD. Since all future plans for Open Burning/Open Detonation will occur in pits well within the interior of the island, the environmental impact on the mangroves of Demolition Key is expected to be minimal to none.

Sea Grasses such as Shoal Grass and Turtle Grass skirt the outer boundaries of Demolition Key. These grasses are protected by the Florida Wetlands Protection Act of 1984. Continuous above ground detonations by EOD in the past created a channel which divided Demolition Key into two smaller islands. Due to the fact that all OB/OD operations underwater are conducted in this channel between the two keys, and the channel itself contains no sea grasses, there is no available data on the effect underwater detonations would have on them. Several variables such the amount of explosives, the type, and their proximity to the sea grasses would have to be determined in order to make any environmental suggestions or conclusions.

III. CHARACTERISTIC FAUNA

Although there appears to be no fauna which make Demolition Key a permanent home at this time, three key animals were noted during the site visit which could possibly be affected by Open Burning/Open Detonation operations on Demolition Key: the "sea cow" or manatee, rose corals, and the migratory Least Tern bird. It should be noted that none of these animals were spotted during the site visit to the island.

The manatee has had a great share of publicity and is currently a major concern of many Florida environmentalists. The recent increase in manatee deaths are due primarily to the great surge in boat traffic on Florida's waterways. The unsuspecting sea mammals are most severely injured or killed by passing motorboat propellers. The manatee is protected by two federal laws: The Marine Mammal Protection Act (1972), and the Endangered Species Act (1973). The Manatee Sanctuary Act (1978) was passed by the state of Florida to further ensure the well being of the manatee.

According to data base information from the Manatee Protection Program, very infrequent sightings of manatees have been reported in the keys and no mortalities have been reported. The nearest sighting of a manatee was around Marathon Key, Fla. which is about 45 miles away. For this reason it appears that OB/OD operations on Demolition Key will have no adverse environmental effect on the manatee population.

Rose corals are small, hard corals which grow in very shallow, soft sediment bottoms such as those around Demolition Key. Just as the sea grasses, there is no data on the effect that underwater detonations would have on the coral. In fact there is no data to indicate whether or not the rose coral grows in the vicinity of Demolition Key or not. Divers or snorkelers would be needed to determine their presence or absence.

The most prominent environmental concern is the nesting patterns of the Least Tern. The Least Tern is a small migratory bird (approximately 8" tall with a 20" spread) whose nesting season is late April through August. The Tern prefers to nest in open, flat, gravelly areas that are cleared so as to allow it to have an unobstructed view of approaching predators. This species of Tern is currently

entangled in a regulatory controversy. The State of Florida has declared it a threatened bird which should therefore be appropriately protected. The Federal Government to the contrary, declares that it is not threatened. Regardless of this current debate, Florida's determination that it is a threatened bird and the fact that Key West has the largest nesting population in the United States is cause enough for environmental impact concerns at Demolition Key. The possible problem stems from the fact that the interior of the island must be cleared of all vegetation to eliminate any fire hazards and to allow for visibility in evaluating test shots. This clearing process possibly makes Demolition Key an attractive nesting location for the Least Tern. At this time there is no evidence that the Least Tern or other similar birds are nesting on Demolition Key. If in fact the clearing process does attract the Tern to Demolition Key, then the issue must be addressed.

IV. CONCLUSIONS

Currently there is no conclusive evidence as to the specific environmental impacts that Open Burning/Open Detonation would have on the flora and fauna of the Demolition Key area. Preliminary visits and investigations seem to indicate that operations would produce only minimal effects. The flora and fauna on Demolition Key have coexisted with EOD activities since the spoil island was created, however; this does not satisfactorily prove that there are no negative environmental effects. In order to more accurately determine the complete extent of environmental impact on local wildlife, an extensive environmental impact study employing local experts would be required.

APPENDIX G

APPENDIX C

DEPARTMENT OF DEFENSE OB/OD SOILS STUDY CONCLUSIONS AND RECOMMENDATIONS

1. CONCLUSIONS.

a. Significant soils contamination was detected at the OB sites of 9 of the 12 installations included in this summary. However, this contamination was limited to the top 18 inches of soils at eight of these sites. Contamination at greater depths at the ninth installation was primarily due to the presence of a buried OB pad at the existing site.

b. At the only OB site where lateral subsurface migration of contaminants was confirmed, this contamination was not due to OB operations. Lateral migration of contaminants with ground water was possible at two other sites.

c. Vertical migration of contaminants was detected at two OB sites and considered to be possible at a third site.

d. Runoff-related surface contamination was present or possible at OB units located at 5 of 12 installations sampled. In some locations, the potential exists for significant contamination of downgradient soils and/or surface waters through this avenue.

e. The TEP metals most frequently detected at OB sites in significant concentrations were lead and barium.

f. The explosives most frequently detected at OB sites in significant concentrations were, in order of decreasing frequency of detection, TNT, 2,4-DNT, RDX, HMX, and 2,6-DNT.

g. The only two installations where vertical migration of contaminants was detected and lateral migration was possible have very shallow ground water and significant excess precipitation. Contamination could be less of a problem at installations with ground water at greater depths due to dilution, adsorption, and degradation, and at installations without excess precipitation due to the lack of a driving force to cause contaminant migration.

h. Runoff-related contamination problems are of primary concern at installations with soils having low permeabilities. The design of the OB unit and the topography of the site are also critical factors in determining whether runoff problems will occur.

i. The extensive list of "good and poor" OB/OD operational practices, can be used to prevent or minimize health and environmental impacts. The most important of these practices include only burning PEP wastes, not burning liquids, controlling runoff/runoff, using burning pans, collecting residues after each operation and testing them for hazardous waste characteristics, and storing and disposing of residues properly.

j. The OB/OD site selection guidelines can be used to relocate or select new OB/OD sites to minimize impacts to human health and environment. Units located within 100-year floodplains pose potentially severe environmental risks.

k. The state-of-the-art OB unit design using burning pans will prevent or minimize environmental contamination.

l. The data and interpretations presented in this Manual can be utilized to assess the environmental impact of past OB activities rather than of future activities.

m. The data presented in this Manual, as well as the supporting data in the field survey reports, can be utilized in the RCRA-regulated closure of the old OB sites.

n. Although surface contamination at OD sites is less than that detected at OB sites, the OD sites are predicted to have subsurface contamination in the form of small but concentrated "hot spots," which is worse than the contamination found at the OB sites. However, environmental conditions at most OD locations act to minimize contaminant migration.

o. Only limited toxicity testing of OB/OD residues and contaminated soils has been conducted.

p. Based on the results of the Bureau of Mines reactivity test, it is unlikely that the concentrations of explosives detected in OB/OD soils are reactive. However, it must be stressed that no reactivity tests have received official regulatory approval.

q. The data contained in this Manual is suitable for use by the EPA as background information to complete the RCRA Part B Permit Writers' Guidance Manual for OB/OD Units.

2. RECOMMENDATIONS. The following recommendations are based on good environmental engineering practices.

a. Develop a policy statement for OB/OD operations incorporating the "good and poor" operational practices listed in this Manual.

b. Develop a policy statement concerning the use of the OB/OD site selection guidelines, patterned after the factors involved in site selection contained in this Manual, for establishing or relocating OB/OD units.

c. Close, relocate, or upgrade those OB/OD units located in regulatory flood hazard areas.

d. Use burning pads or other containment systems for OB of PEP wastes rather than conducting OB operations directly on the soil surface.

e. Utilize the data presented in this Manual, as well as the supporting data in the field survey reports, to aid the development of OB site closure plans.

f. Initiate a research program to determine the chemical toxicity of OB/OD soils.

g. Present the data contained in this Manual to the EPA for use as background information in completion of the RCRA Part B Permit Writers' Guidance Manual for OB/OD Units, and other DOD activities which perform OB/OD operations.

APPENDIX D

DEPARTMENT OF DEFENSE OB/OD GROUND-WATER STUDY CONCLUSIONS AND RECOMMENDATIONS

1. CONCLUSIONS.

a. Ground-water quality has been investigated at 19 OB/OD Army units by obtaining samples from a total of 109 monitoring wells. Analysis was accomplished for heavy metals, explosive compounds, and, at half the installations, purgeable and extractable organic substances.

b. Using a conservative method of interpretation, 9 of the 19 units showed some type of ground-water pollution attributable to OB/OD operations. Nonbackground levels of metals exceeded criteria at only two sites and nonbackground levels of volatile organics exceeded criteria at two other sites. Explosive parameters exceeded criteria at eight locations.

c. In the majority of the western portion of the country, the major factor which precludes ground-water contamination is apparently the significant excess of evaporation over precipitation. In the eastern half of the country, the predominant factor precluding significant contamination is low soil permeability. An important secondary consideration, however, is the level of explosives concentration at and near the surface of the site.

d. In general, the type of aquifer, depth to water, temperature, size and age of unit, and the species of metals contamination in surficial materials showed little or no correlation with resultant ground-water quality.

e. Based primarily on apparent leaching potential, the explosives RDX, TNT, and 2,4-DNT should be of greater concern at OB/OD sites than 2,6-DNT, HMX, and tetryl.

f. Organic contamination should not be a problem at OB/OD units if:

(1) Explosive wastes are not placed in unlined pits or trenches at or very near the water table.

(2) Nonexplosive organic compounds are not disposed of at these units.

2. RECOMMENDATIONS. The following recommendations are based on good geohydrologic practice from the perspective of ground-water quality protection.

a. Accomplish OB operations in waste containment devices to isolate the wastes from the soil. Properly dispose of the residue based on results of testing for reactivity and TEP metals. Do not place explosive wastes in unlined pits or trenches for purposes of OB or OD.

b. Do not treat or dispose of nonexplosive organic materials or wastes at OB/OD units.

c. To the maximum extent practicable, either use existing OB/OD units or site new OB/OD units within arid or semiarid regions of the country, and/or within areas possessing soils of low permeability (less than 10^{-6} centimeters per second).

d. Employ routine quarterly ground-water monitoring for metals and explosive compounds around all currently active OB units* which do not have greater than 2 feet per year of excess evaporation (as defined herein).

e. Accomplish any monitoring, study, or remedial actions deemed appropriate at those specific units studied herein which have demonstrated ground-water contamination.

*NOTE: At the time of this study, essentially all OB in the Army was being accomplished on the soil.